MiVoice MX-ONE
Install and Upgrade
Release 7.4
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Contents

Installation - Software Only

This topic describes the SW installation and initial configuration of the MX-ONE.

Introduction

This document describes the SW installation and initial configuration of the MX-ONE.

The installation can be of the following three types:

Turnkey solution

The customer has bought both server and SW from Mitel. Mitel provides the operating system SUSE Linux Enterprise Server 12 SP5 (SLES12 SP5 x86_64) and containing the MX-ONE Software included on Recovery Image.

SW Only

The customer provides its own SLES12 SP5 x86_64 compatible Server and Operating System, OS (SLES 12 SP5 x86_64) including Linux support subscription. Mitel provides a Media Kit containing the MX-ONE Software. OS needs to be installed on the server(s). For details, see SW Only Installation on page 12. The hardware clock of the server must also be set to a rather accurate value.

Virtual Appliance

A virtual appliance is a virtual machine image designed to run on a virtualization platform. The MX-ONE Service Node Virtual appliance includes the Operating System (SLES12 SP5 x86_64) and the MX-ONE Software.

A template file with all settings needed for a new virtual machine is included on the Recovery Image, use the media to install the operating system and application.

The MX-ONE Service Node Virtual Appliance runs on top of a VMware infrastructure, vSphere ESXi 5.5 hypervisor (minimum).

ASU-III support virtualization and has been verified with VMware 7.0 and 6.7. ASU-II support virtualization and is officially verified with VMware 5.5. ASU Lite does not support virtualization.

Note that Mitel does not supply any VMware software together with the MX-ONE Service Node.

Scope

The installation and initial configuration of the MX-ONE takes place upon first startup of the system.

The first part of the document specifies the preparation steps for the Installing OS and configuring the application.

The media gateways are initiated after the initial system configuration.

NOTE: For Linux related configuration questions, see the SuSE Linux Enterprise Server 12 documentation, *https://www.suse.com/documentation*.

Target Group

The target group for this document is personnel installing and configuring software for the MX-ONE.

Prerequisites

General

Before proceeding with the software installation:
- Make sure all cables are firmly connected and all hardware is properly installed. See the installation instructions for *INSTALLING MX-ONE HARDWARE.*
- The layout of the network must be defined. See the description for *MX-ONE SYSTEM PLANNING.*
- It is recommended for engineers installing the MX-ONE to be acquainted with the following areas:
  - MX-ONE Service Node
  - MX-ONE Service Node

  - MX-ONE Lite (3U, with MGU board)
  - MX-ONE 1U (former Slim, with MGU board)
  - MX-ONE Classic (7U, with MGU board)
  - MX-ONE Media Server (SW variant for SIP-only scenarios). See description of the MX-ONE Media Server for installation instructions for the MX-ONE Media Server.
  - Certification
  - TCP/IP Networks
  - XML
  - Linux
  - Databases, like Cassandra, LDAP, SQL, AD
- The following equipment is necessary:
  - VGA screen
  - Keyboard
  - USB memory
  - Mouse (if needed)
  - USB hub (in case a USB mouse is used)
- Special consideration must be taken for the system database (Cassandra) deployment and server requirements. For systems larger than 6 Service Node servers/LIMs, it is recommended to deploy the system database on a stand-alone server (i.e. not co-located with the SN). See the description *SYSTEM DATABASE (CASSANDRA)* .
- Special consideration must be taken for redundancy. See chapter Redundancy Considerations.

SW Only Installation

NOTE: The customer provides its own SLES12 SP5 compatible server and Operating System (including Linux support subscription).

These are the minimum requirements for the MX-ONE Service Node when performing a SW Only installation. For a server with up to 1000 extensions (users):
- Processor: 2 GHz Intel Celeron J1900 2.0 GHz Quad core (ASU Lite)
- RAM memory: 8 GB

- Disc: 120 GB
- Intel x86 architecture
- Chipset with watchdog implementation
- LAN ports: 2 (100 or 1000 Mb/s)
- USB: 2 (USB 2.0 at least)
- Console I/O

For a server with up to 7500 extensions (users) the following minimum requirements apply.
- Processor: Intel i7 2.4 GHz Quad Core (or equivalent) (ASU-II)
- RAM memory: 16 GB
- Disc: 250 GB
- Intel x86 architecture
- Chipset with watchdog implementation
- LAN ports: 2 (100 or 1000 Mb/s)
- USB: 2 (USB 2.0 at least)
- Console I/O

The following installation media/softwares must be available:
- SuSE Linux Enterprise Server 12 SP5, bootable media
- MX-ONE Media Kit

For larger installations (up to 15000 extensions) industry standard Intel X86 server, such as DELL Power edge R4x0 series with a Xeon E3-12XX V5 3.0 Ghz Quad Core, or Xeon Silver 4215 2.5 GHz or with later CPU's, with up to 32GB memory minimum should be used.

Virtual Appliance

For more information, see description *MX-ONE SERVICE NODE VIRTUALIZATION* and installation instruction *MX-ONE SERVICE NODE VIRTUAL APPLIANCE*.

Overview

General

The MX-ONE can comprise one or several MX-ONE Service Nodes, each, depending on the type of media gateway, can serve from one to fifteen media gateways. For more information, see the installation instructions for `INSTALLING MX-ONE HARDWARE.`

Each MX-ONE Service Node is assigned a Server number. Server 1 will distribute the configuration data to all other Servers. Also, Server 1 hosts the MX-ONE Service Node Manager, which provides a web interface to set the telephony related data for the system, like number series, operators, and so on, after the initial configuration. MX-ONE Provisioning Manager can be installed on any server part of the system or on a stand-alone. It is used for configuring user settings.

Network redundancy can be achieved by connecting the servers to a redundant network infrastructure and using Ethernet bonding.

Server redundancy is achieved by arranging the servers in clusters. A cluster is a number of servers with one designated standby server. The MX-ONE can have a maximum of 10 servers defined per cluster.

For more information about redundancy, see the description for *MIVOICE MX-ONE*.

Basic network configuration data setup for every Server needs to be done locally.

The media gateways are added to the system after the system configuration, in the post-installation routines.

NOTE: In a system with more than 32 Servers (LIMs), it is recommended to configure a Standard Server, with large hard disk capacity as Server 1, or else it will not be possible to upgrade the system.

NOTE: Do not use YAST, since it may cause system malfunctions. (Instead use the mxone_maintenance tool).

Workflow

Depending on the type of installation, use of HTTPS, TLS and so on, the procedure for installation and initial configuration differ:

1. Obtain digital certificate (only if HTTPS or TLS is used)

2. Collect needed IP addresses for the system

3. Install operating system and application

4. Perform Network setup for Server 1 (LIM 1)

5. Perform network setup for all other servers

6. Configure the entire system and perform the installation

7. Reconfigure MX-ONE Service Node Manager if HTTPS is used as mxone_admin using MX-ONE maintenance tool.

8. Initial configuration completed

Preparations

Installation and network configuration is done at once, starting with the server that should be Server 1. Configure the network on Server 1, continue with the rest of the server in the system.

NOTE:

• Before the installation can begin, the network configuration must be known.

• New installation of server 1 will change the system Hardware ID. It is strongly recommended that a permanent license file is ordered after Installation Test for MX-ONE is completed.

No Redundancy

When redundancy is not used, the MX-ONE can be configured with only one LAN interface.

On the Media Gateway Unit (MGU, meaning either MGU board or MX-ONE Media Server) both control and media is accessed on the same LAN interface. The MGU board is either located in an MX-ONE Lite, MX-ONE Slim or in an MX-ONE Classic media gateway.

The MX-ONE Media Server is either co-located with the MX-ONE Service Node or running on a separate server. The MX-ONE system database is either co-located with the MX-ONE Service Node or running on a separate server, but is not shown here.

Figure 1.1: A non-redundant scenario with MGU and MS media gateways
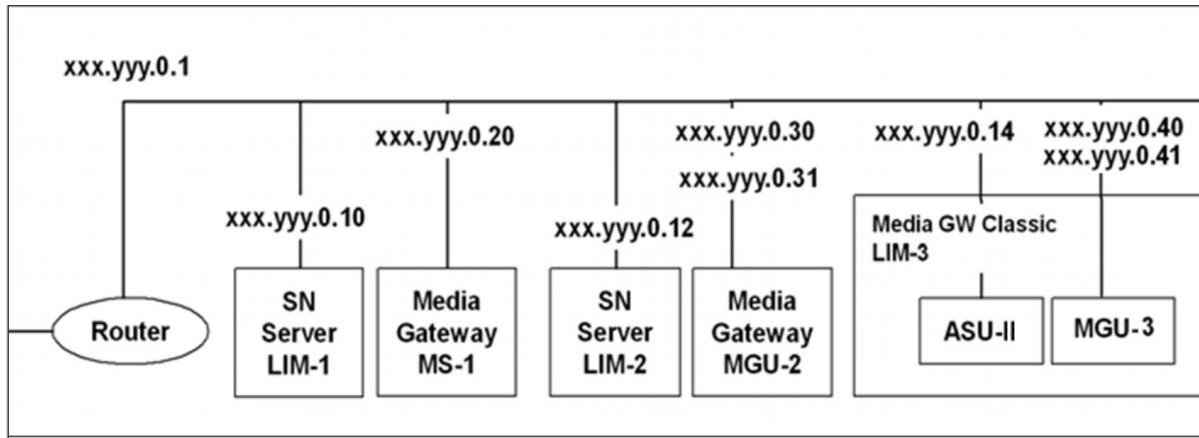
Network Redundancy by Using Ethernet Bonding

By using Ethernet bonding, a switched network with a single subnet can be used for network redundancy.

When using Ethernet bonding, two Ethernet interfaces are aggregated to a logical unit where one interface is active at a time, while the other interface acts as a backup. The two interfaces share the same IP and MAC addresses. If one of the interfaces fails, the other one will become active and continue to serve the operations, and the MX-ONE Service Nodes will be available on the functioning interface.

Ethernet bonding is only supported in the MX-ONE Service Nodes. The MGU has implemented a link fail-over mechanism that provides a similar functionality, if the active link fails the backup link will take over, see *Example 2* for details.

Link-failover is automatically enabled when there is a redundant LAN connected to MGU, but for proper alarm monitoring it is required to configure Link-failover mode during MGU board setup. See the section *Configure the Media Gateways*.

The allowed configurations for network redundancy using Ethernet bonding are shown in the following figure.

Figure 1.2: Server redundancy with Ethernet bonded network redundancy. System database is not shown

here.
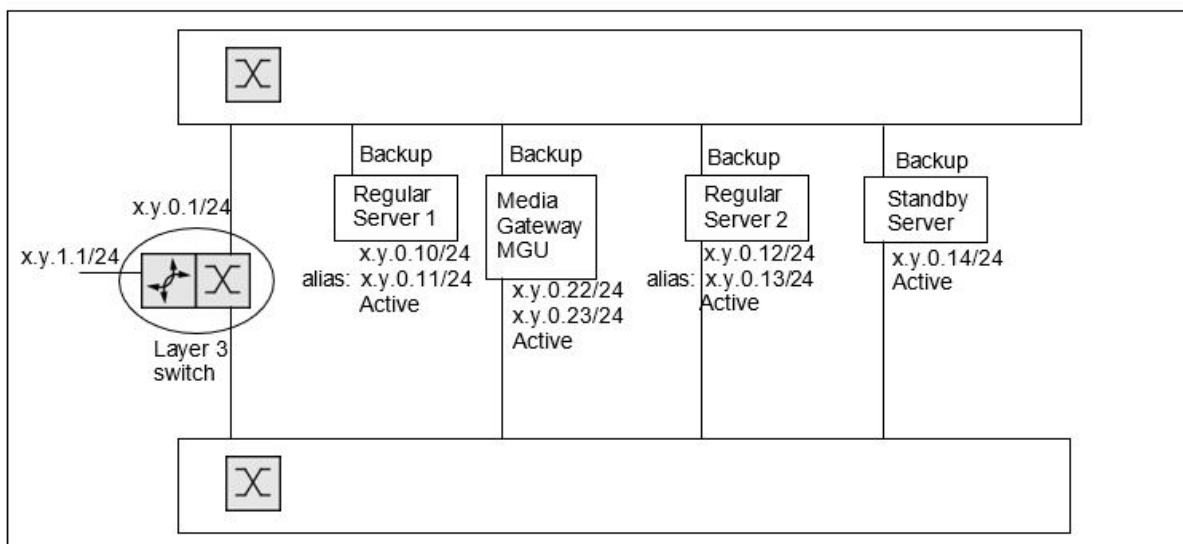
The MGU set up as for a non-redundant system. see *Example 1* for more details.

Obtaining a Digital Certificate for the SNM

The MX-ONE supports HTTPS for secure access to the web-based MX-ONE Service Node Manager. During the installation, the system is configured to use either standard HTTP or HTTPS. With HTTPS, it is necessary to configure a private key, and a digital certificate, to be used in the system.

For more information about the MX-ONE Provisioning Manager and MX-ONE Service Node Manager certificate handling, see the description for AD AUTHENTICATION.

The digital certificate can either be generated as a self-signed certificate during the installation or bought from a commercial certificate supplier. Note that a self-signed certificate provides limited security unless the certificate is properly and securely distributed to all clients. It is recommended to use a self-signed certificate during the installation, a commercial certificate can be installed later if needed. For more information about obtaining a digital certificate, see the operational directions for `CERTIFICATE MANAGEMENT`.

Collecting Data

Before configuring the network and the system, some data must be collected. This data is used for basic network configuration.

Fill in the required information in the tables below:

Table 1.1: General Installation Configuration Data for server 1 (Sheet 1 of 3)

Note	Type of Information	Value
Network data:		
If IPv4 is selected	Master Server IPv4 address/CIDR [1)	

Table 1.1: General Installation Configuration Data for server 1 (Continued) (Sheet 2 of 3)

Note	Type of Information	Value
	IPv4 default gateway	
	Host name	
	Domain name	
	Data Center name	
	Rack name	
Only if IPv6 and IPv4 dual stack is selected	Master Server IPv6 address/CIDR	
Only if no Router Advertisement is missing	IPv6 default gateway	
System data:		
It is required to use an external NTP server to have correct time setting in the system.	IPv4 address to NTP server	
Max 3 ip addresses	IPv4 address to DNS forwarder server	
Max 5 domain names and max 256 characters	Search list for host-name lookup up	
	Cassandra system database IPv4 address[1]	
Only if IPv6 and IPv4 dual stack is selected	Cassandra system database IPv6 address	
	Market (country) Default (if no other market is selected) is *Standard*.	
	DiffServ Code Point for Media The Diffserv code point for media is used to divide the voice part of the IP traffic into classes. Different classes have different priorities. The traffic with the highest priority will be sent first. Default is Expedited forwarding (traffic class 101, drop precedence 110) giving DSCP 101110.	Refer to the description on DiffServ found, for example, in the description for *CONFIGURATION FILE FOR DBC 42X* , in the chapter Diffserv settings. See *RFC: 2598*

Table 1.1: General Installation Configuration Data for server 1 (Continued) (Sheet 3 of 3)

Note	Type of Information	Value
	DiffServ Code Point for Call Control The DiffServ code point for call control is used to divide the connection part of the IP traffic into classes. The different classes have different priorities. The traffic with the highest priority will be sent first. Default is traffic class 100 and drop precedence 110, giving DSCP 100110.	Refer to the description on DiffServ found, for example, in the description for *CONFIGURATION FILE FOR DBC 42X* , in the chapter Diffserv settings. See *RFC: 2598*

[1])Must belong to same subnet, when co-located system database is used.

NOTE: It is recommended to print a separate copy of *Data for basic network configuration and Server (LIM) configuration* for each Server in the system and fill in the values for easy access to the information during the configuration. Data for the media gateways is needed after the system configuration.

Table 1.2: Data for basic network configuration and Server (LIM) configuration

Note	Type of Information	Value
	Server (LIM) number	
	Server host name A unique host name.	
ARP parameters (Applicable only for bonded systems)	**ARP interval** (in milliseconds)	
	ARP validate	Normally set to 1.
	ARP IP Target	Normally set to the default gateway address, and the media gateway address.
	Primary	Normally eth0.
Server network interface - 1 (eth0)	**IP address**	
	Subnet mask	
	Default gateway	

Clustering is used for server redundancy. Here each MX-ONE Service Node that belongs to the cluster is assigned an alias IP address to each of its connected LANs. For more information, see the description for *MIVOICE MX-ONE*, on Redundancy.

Table 1.3: Cluster Configuration Dat a

Type of Information	Value
Cluster name	
Server Number The Servers that should be included in the cluster	
Standby Server Host Name	
Sync Time The time in hours and minutes when the standby server will synchronize the reload data.	

Table 1.4: Configuration Data for each Server in the Cluster

	Type of Information	Value
Base Address, old and new, Network Interface - 1	**IPv4 Addresses**	
Base Address, old and new, Network Interface - 1 (if dual stack selected)	**IPv6 Addresses**	

Turnkey Installation Preparations

For more information, see operational directions Administrator User's Guide, chapter 5.1 *Using recovery image*.

SW Only Preparations

During the OS installation the appropriate Media kit (which contains a number of xml files for the installation and MX-ONE Installation package) must be available in a USB memory stick. The files contain the correct settings for the installation.

NOTE: The MX-ONE will use the whole disk, and will re-format the entire disk. No other software can reside in any partition.

Virtual Appliance

For more information, see description MX-ONE Service Node Virtualization and installation instruction, *MX-ONE Service Node Virtual Appliance*.

Installation and Initial Configuration

Depending if the installation is a Turnkey or SW Only installation the starting point differs.

- If it is a Turnkey installation the basic network configuration can be performed directly, see *Recovery Image Installation* chapter for more information.
- If the installation is a SW Only installation the Operating System and the MX-ONE Service Node need to be installed on the server prior the basic network configuration, see chapter *SW Only Installation* for more information.

Recovery Image Installation

To install the recovery image, perform the following steps:

OS Install

1. Boot the machine from the storage media with Recovery Image.
2. Enter BIOS mode.
3. Change the date if necessary. Other parameters might also need to be modified (Set Time Zone).
4. If USB is used, make sure that the boot order is: Hard disk, USB.
5. Re-boot the machine from the storage media.
6. At the initial screen select the "Install" option. Press Enter.

   NOTE: If the partitioning fails, the disk is not clean. Use the FDISK utility to partition the disk. For example, run fdisk from a Linux Live-CD.

   NOTE: Beware of the timeout when the first screen appears. In case no selection is made, the system will boot with default parameters and the configuration file will not be read.

7. Log on as root. (Default password is set to "changeme". Change it during the installation.)
8. Restart the server by typing **reboot** at the shell prompt.
9. The OS is now installed on the server HW.
10. Repeat for all servers as necessary.

MX-ONE Service Node Install

To start the installation of MX-ONE, login as root and start the installation with `/sbin/net_setup` command. See chapter, *Network and System Configuration* for details. This will setup the network and start the installation. Always start from Server1.

SW Only Installation

NOTE: The customer provides its own SLES compatible server and Operating System, OS (SLES12 SP5 x86_64) including Linux support subscription. Mitel provides a Media Kit containing the MX-ONE Software.

To install the OS and the MX-ONE Service Node, perform the following steps:

OS Install

1. Boot the machine from the storage media with SLES12 SP5.
2. Enter BIOS mode.
3. Change the date if necessary. Other parameters might also need to be modified (Set Time Zone).
4. Re-boot the machine from the storage media.

5. At the initial screen:

   – Insert the USB memory stick. For more details, see *SW Only Preparations*.
   – In the Boot Option field (bottom of the screen), enter **autoyast=usb:///**
   – Select **Installation** and press **Enter**.
       > **NOTE:** If the partitioning fails, the disk is not clean. Use the FDISK utility to partition the disk. For example, run disk from a Linux Live-CD.
   – Change disks as prompted by the installation procedure.
       > **NOTE:** Beware of the timeout when the first screen appears. In case no selection is made, the system will boot with default parameters and the configuration file will not be read.

6. Log on as root. (Default password is set to **changeme**. Change it during the installation.)

7. Unpack the MX-ONE_install package, present on Media Kit. Run `<path to package>/MX-ONE_install*.bin --unpack`.

8. Restart the server by typing **reboot** at the shell prompt.

9. The OS is now installed on the server HW.

10. Repeat for all servers as necessary.

MX-ONE Service Node Install

To start the installation of MX-ONE, login as root and start the installation with `/sbin/net_setup` command. For more details see *Network and System Configuration*. This will setup the network and start the installation. Always start from Server1.

SLES12 Update Packages

This section is valid for both SLES Service Packs and for SLES patch packages, if the installation requires an update of the OS.

See the installation instruction *UPGRADING AND UPDATING TO MIVOICE MX-ONE 7.x*, section *SLES12 update packages* for details on how the update is done.

Network and System Configuration

Follow the step-by-step procedures to perform the basic configuration for each server. Here the server host name, the IP address, the default gateway address, and the domain name is set. A proper network connection must be present to be able to configure and set up the system.

For a system with server redundancy, the standby server is treated as an ordinary server.

Perform the server installation and configuration in the following order:
• Initial setup of master server
• Initial setup of other servers
• Configuring the entire system (from master server)
• Post-installation Configuration

Initial Setup of the Master Server

This section provides a high-level description of the installation steps.

NOTE: Not all options are described. For example, while IPv4 configuration steps are given, the IPv6 steps are not. For IPv6 configurations, follow the options that appear on the GUI when you choose IPv6. Similarly for other options such as QoS settings or network bonding, follow the options that appear in the GUI.

1.

2.
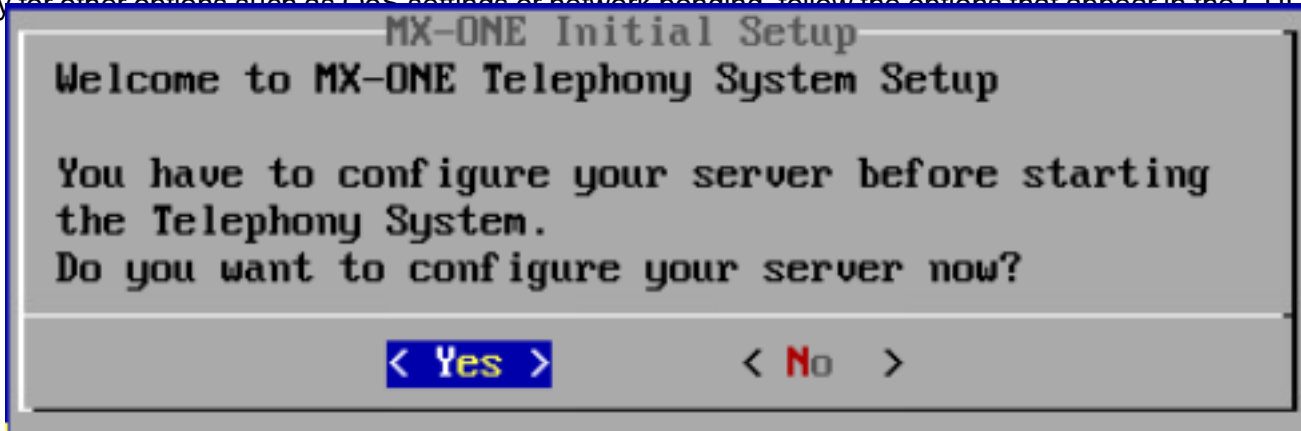
3. Select **Yes**. The **System Keyboard Configuration** screen appears.

4. From the **System Keyboard Configuration** screen, select the required **Keyboard Layout**.

5. Select **OK**. The **Clock and Time Zone** screen appears.

6. From the **Clock and Time Zone** screen, select the Region and Time Zone.

7. Select **Master server (Lim1)**and select **OK**.

Figure 1.4: Master Server (Lim1)
screen
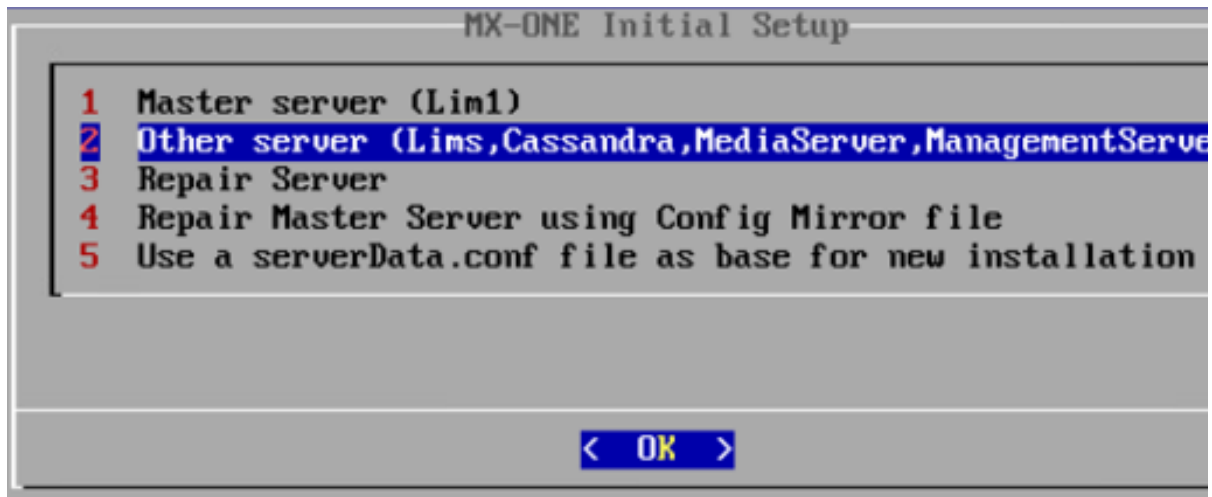
8. You can choose if bonding shall be used or not. Note that bonding may be also configured after the initial setup is done using mxone_maintenance tool.

9. Select the type of IP stack to be used - either only IPv4 or both IPv4 and IPv6 (dual stack). (In this example, only an IPv4 address is configured.) Select **Configure only ipv4** and click **OK**.

Figure 1.5: IP stack selection
screen
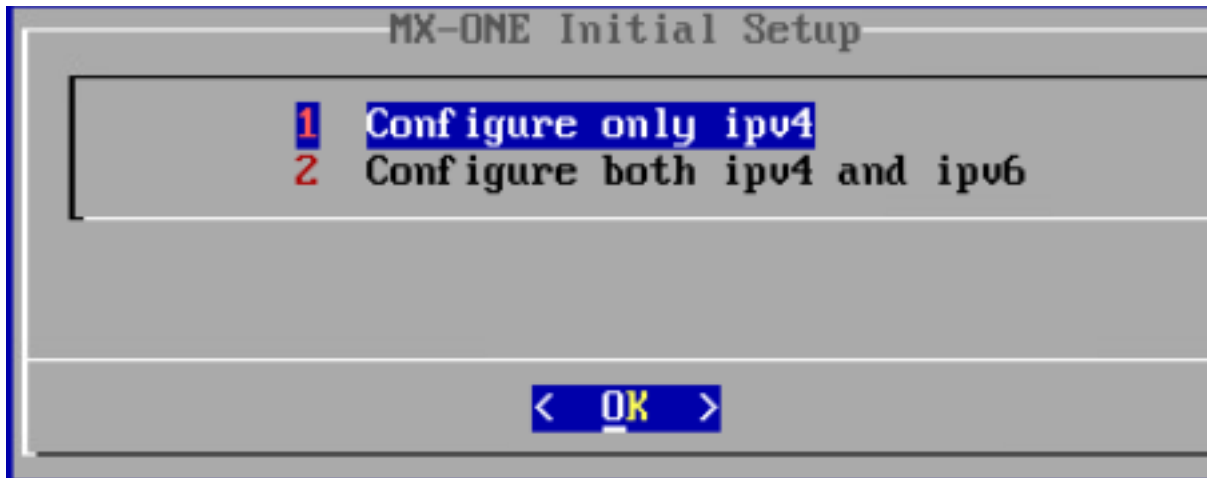
10. Enter the configuration details such as the IPv4 address, hostname, domain name, data center name, rack name of master server, and then click **OK**.

11. Enter the passwords for user accounts root, mxone_admin, and mxone_user. The minimum password length is 8 characters and the character * is not allowed in a password. The basic data to continue the initial setup is now collected and the installation may start. It can be continued in the console or later after logging in through SSH.

   NOTE: All passwords in different servers of multi-server systems must be identical.

12. By selecting **Yes,** you can stop the installation and continue later or select **No** to proceed. Regardless of the selection, confirm the data provided.

Figure 1.6: Logging in through

SSH
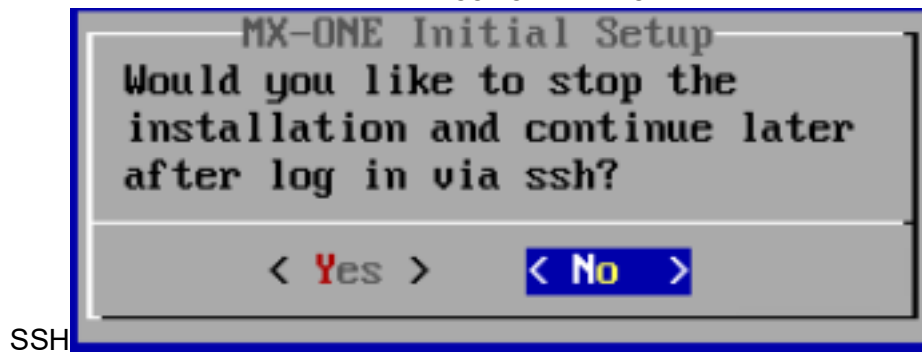
13. If you select **No**, the configuration data entered will be erased and the initial setup wizard will be restarted.

Figure 1.7: Verify the
Configuration

NOTE: **No** refers that the server is restarted and all data is erased.

14. The initial setup for this server is now completed as master server.

Figure 1.8: Completion of initial setup of the
sever
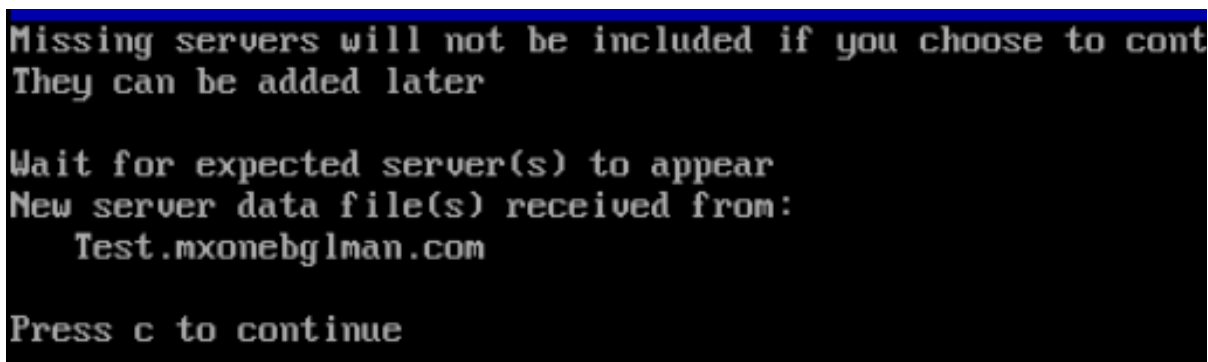
15. Keep this interface to master server open and perform the initial setup of the other servers that shall be part of that system, see section INITIAL SETUP OF OTHER SERVERS. If no other servers shall be installed or when for all other servers the initial setup was completed, in the master server console press **c** to continue with the installation. Continue with section CONFIGURING THE ENTIRE SYSTEM (FROM THE MASTER SERVER).

Initial Setup of Other Servers

NOTE: The following procedure must be run on all servers in the system, both LIMs (that are not Lim1), and other servers such as standalone Media Servers, Cassandra server, or Provisioning Manager applications.

NOTE: The intended Cassandra servers (nodes), or at least ONE Cassandra server (node), MUST be initiated before you configure the entire system, i.e. finish the initiation of the Master LIM. In other words, a functioning system REQUIRES a system database.

1. If not already done, connect to the server console - connect keyboard and monitor when real server or open console on vmware.

2. To start the network configuration log in as root (password **changeme**) on server1/lim1 (master server) and run the following command: `#sbin/net_setup`.

3.

< Yes >   < No >

4. Select **Yes**. The **System Keyboard Configuration** screen opens.

5. Select the **Keyboard Layout**.

6. Select **OK**. The **Clock and Time Zone** screen appears.

7. From the **Clock and Time Zone** screen, select the **Region and Time Zone**.

8. Select **OK** and select the type of initial setup.

9. Select **Other server (Lims, Cassandra, MediaServer, ManagementServer)**.

Figure 1.10: Type of initial
setup

```
MX-ONE Initial Setup
1   Master server (Lim1)
2   Other server (Lims,Cassandra,MediaServer,ManagementServe
3   Repair Server
4   Repair Master Server using Config Mirror file
5   Use a serverData.conf file as base for new installation




                        <  OK  >
```
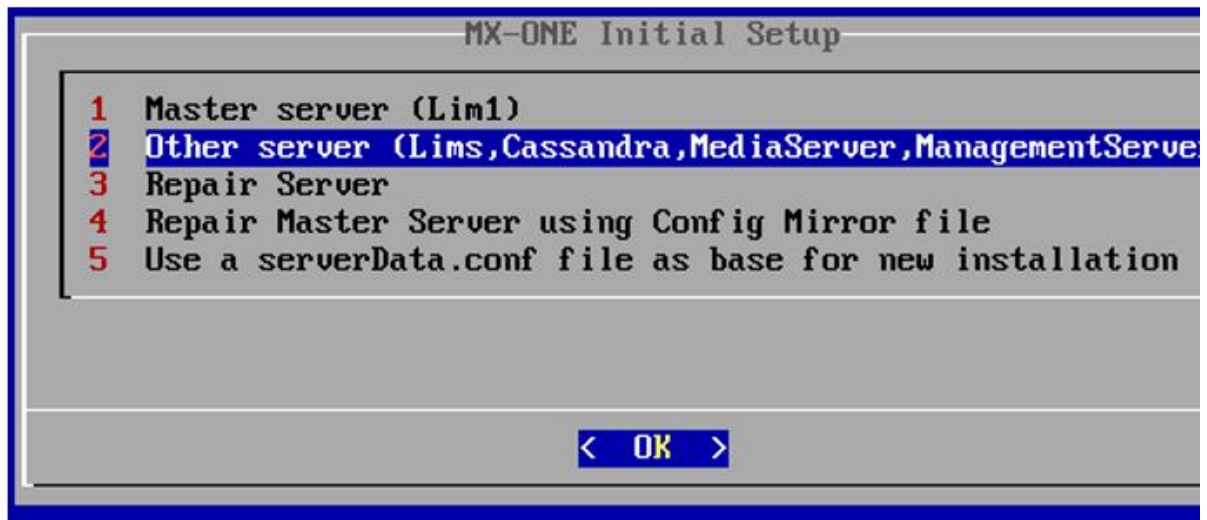
10. Repeat Step 10 to Step 16 of the master server initial setup. Make sure you provide the IP address of the master server when specifying configuration details for IPv4 or IPv6.

11. After the configuration has been applied, continue the configuration in master server.

Figure 1.11: System configuration in the master server
console

```
Copying result to master server.
(Will retry for ever, press "ctrl-c" to abort, )

Action from this server SUCCESSFUL
Continue installation from Master Server
v7-server2:~ #
```
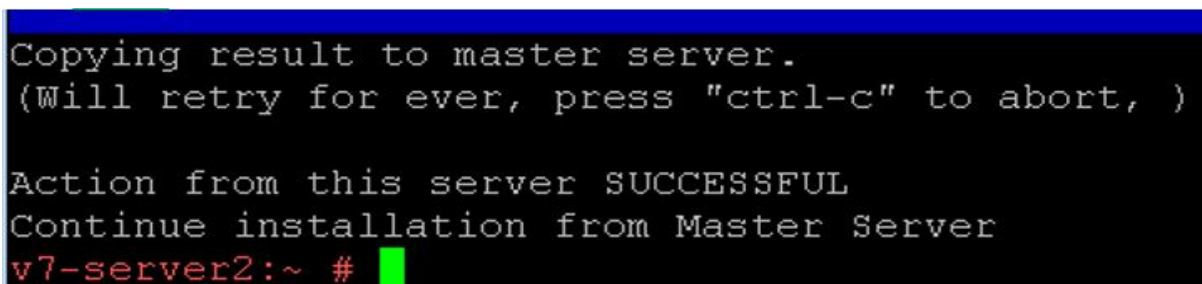
12. Continue with the System configuration in the master server console. See, *CONFIGURING THE ENTIRE SYSTEM (FROM THE MASTER SERVER)*.

Co~~nfiguration~~ — Trial ~~license~~

```
Wait for expected server(s) to appear
New server data file(s) received from:
    v7-server1.mitel.lab
    v7-server2.mitel.lab

Press c to continue
```

2. If all servers are present press c in the master server to finalize the initial setup.

3. Select the trial license type (Traditional or Feature based).

Figure 1.13: Trial license

```
┌─────────────────MX-ONE Initial Setup─────────────────┐
│ Select type of trial license                         │
│ ┌──────────────────────────────────────────────────┐ │
│ │         1  Traditional                            │ │
│ │         2  Feature based                          │ │
│ └──────────────────────────────────────────────────┘ │
│                                                       │
│                                                       │
│                    <  OK  >                           │
└───────────────────────────────────────────────────────┘
```

4. In the example here Traditional is selected and click **OK**.

5. Next must be the IP address of the NTP server configured.

   NOTE: If the NTP server is not reachable or does not reply correctly, the finalization of the initial setup will stop and you have to restart it.

6. Enter the IP address to forward DNS (1-3), which is optional. You can leave it empty or enter up to three different addresses comma separated. Continue.

7. Select the market to use in the system.

Figure 1.14: Market selection

8. Next the Quality of Service settings may be modified.

9. Next select on which server a LIM will be running.

Figure 1.15: Server selection for
LIM
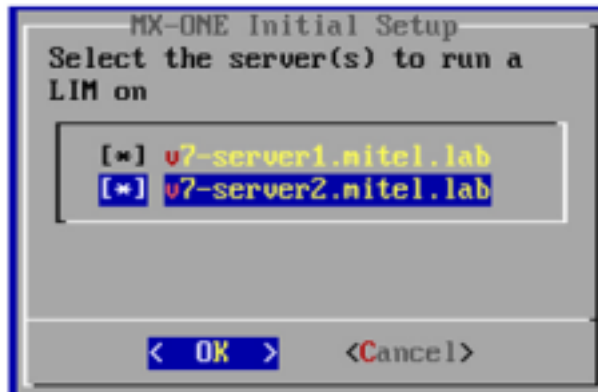
10. Change the LIM number if needed (only for non server 1)

11. Select on which server System Database (Cassandra) shall be installed. At least one server must be selected.

Figure 1.16: Server selection for System Database

(Cassandra)

12. Configure an alias IP addresses for all the selected Cassandra servers.

Figure 1.17: Configuring alias IP addresses for selected Cassandra
servers
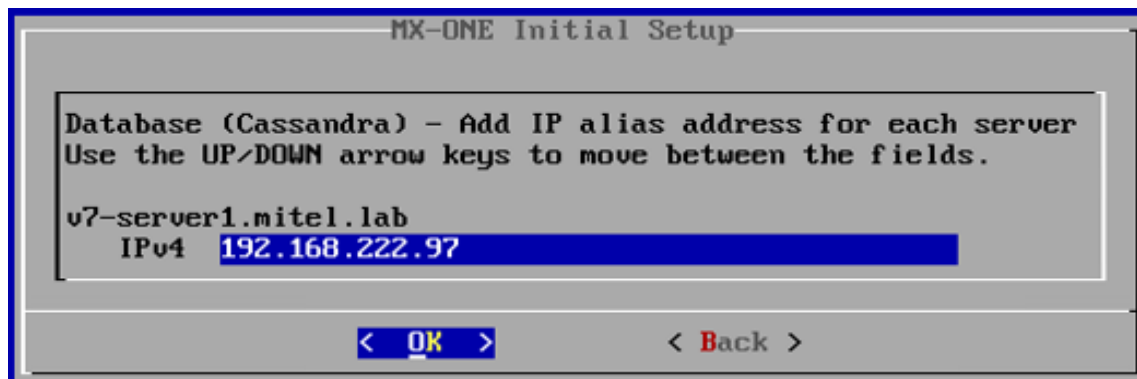
NOTE: Ensure that the IPs are not in use in the network.

13. Select if Media Server should run on any server.
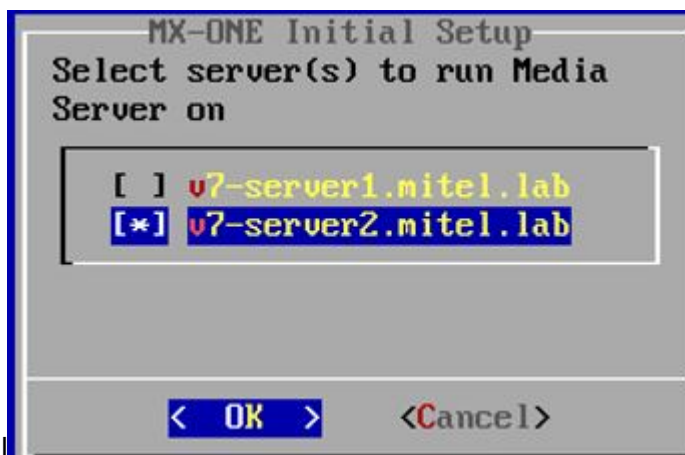
Figure 1.18: Media Server install

14. A summary of the collected data will be presented.

Figure 1.19: Collected data

```
──────MX-ONE Initial Setup──────
Is the following data correct?
If no the application configuration will restart.

License type:   traditional
NTP server:     192.168.222.200
Market:         standard
QoS Media:      EF 0xb8
QoS CallCtrl:   AF43 0x98

DNS forwarders:
        192.168.222.200
        192.168.200.5

DNS domain search:
        -

LIM servers:
        1 : v7-server1.mitel.lab
        2 : v7-server2.mitel.lab

Data Centers:
 DC1 : Rack1
        v7-server1.mitel.lab
 DC1 : Rack2
        v7-server2.mitel.lab

Replication factors:
        1 : DC1

Cassandra database servers:
 v7-server1.mitel.lab
        192.168.222.97/24

Media servers:
        v7-server2.mitel.lab


      < Yes >          < No  >
```

summary

15. After confirming the data, the installation starts and completes.

Figure 1.20: Installation complete
dialog

```
Starting silent installation of mxone_snm rpm
Follow progress by opening another shell and type:
        tail -f -n 0 /var/log/mxone/webserver/application_log.log

Created symlink from /etc/systemd/system/multi-user.target.wants/mxone_jboss.service to /usr/lib/system
Installation of MX-ONE Service Node Manager is finished.
Webserver will now be re-started. This may take a while.
See progress in:
    /opt/jboss/standalone/log/server.log
Finished. See log file /var/log/mxone/webserver/application_log.log for details.

Installation finished successfully
==================================
```

NOTE: You must log off from the root after step 15, and login to mxone-admin again before you start the post-installation configuration.

Post-Installation Configuration

After the successful servers installation, follow the steps in this section to conclude the configuration:

1. Configure the media gateways. See *Configure the Media Gateways* for more information.
2. Some optional features are not loaded by default. See *Optional Programs* for more information.

    To use one of those features, load the corresponding program unit(s) use the `pu_add` command. See the description for *ADD/REMOVE/CHANGE PROGRAM* for more details.

3. Enter the `board_config -scan` command from the MX-ONE Service Node mdsh shell, see the command description for *BOARD CONFIGURATION*. This ensures that all virtual boards on the Media Gateway are registered by the MX-ONE Service Node.

4. Enter the command alarm from the MX-ONE Service Node mdsh shell, see the command description for *ALARM FUNCTIONS*. This ensures that there are no serious alarms in the alarm log.

5. If applicable, check status of SW RAID 1. Logon as root and key command `mdadm -D /dev/md0`, `mdadm -D /dev/md1`, and `cat /proc/mdstat`.

6. Optional, network redundancy, that is, Bonding

    Run the `mxone_maintenance` command that starts the Maintenance Utility and select **Option Bonding** settings in system

7. Optional, server redundancy

    For details, see Operational directions for *SERVER REDUNDANCY*.

8. Execute Installation Test for MX-ONE.

    For details see Operational Directions for *Installation Test for MiVoice MX-ONE*.

9. Place a new order on the order desk to receive a permanent license file.

    For more details, see Operation Directions for *ADMINISTRATOR USER'S GUIDE*

Optional Programs

For efficiency reasons there are a number of program units that are not loaded by default.

Optional features

Feature	Program Units
Paging	PGP1, PGP3
ISDN S0	ITBP, ITLBP, ITLP, ITP
Inter-Gateway Routing	IGWP
SNMP w/Ericsson MIB	ASNMP
TL1	TLP1
TL4	TLP4
TL11	TLP11
TL12	TLP12
TL19	TLP19
TL22	TLP22
TL25	TLP25
TL26	TLP26
TL35	TLP35
TL37	TLP37
TL38	TLP38
TL45	TLP45
TL49	TLP49
TL50	TLP50
TL51	TLP51
TL72	TLP72
TL81	TLP81
TL95	TLP95

For more information, see the parameter description for the `UNIT` parameter, in *Technical Reference Guide*, MML parameters.

Other Optional Software

If certain optional external applications are wanted, there may be additional SW (not part of the Service Node) that also needs to be installed. Examples are for the CSTA server, management applications like

the Provisioning Manager and the IP Phone SW Server (IPP), and CIL/SMDR post-processing applications. See installation documentation for each function.

Recovering from Failure

If the installation is not successful, it is recommended to run the installation again from the beginning from the Recovery Image.

Completing the Configuration

Most of the remaining configuration of the MX-ONE Service Node can be made using the web based MX-ONE Service Node Manager. The MX-ONE Service Node Manager provides different walk-throughs for the setup of the MX-ONE. See the *MX-ONE SERVICE NODE MANAGER USER GUIDE* for further information.

Users of the MX-ONE Service Node Manager can be configured either by MX-ONE Provisioning Manager or through the Linux system. For more information, see the description *MX-ONE PROVISIONING MANAGER* and the installation instruction *INSTALLING MX-ONE PROVISIONING MANAGER*.

It is also possible to configure the system using the command line interface, see the description for *COMMAND ADMINISTRATION*.

Configure the Media Gateways

For the MX-ONE Service Node to be able to communicate with its media gateway it must know the IP address of the media gateway control port, eth0. If needed, it must be set on the media gateway hardware. If link-failover is used, then also required link-failover mode shall be selected.

There are two major types of MX-ONE media gateways:

- The media gateway built around the MGU board.
  For instructions on how to set the IP address, to be able to reach the MGU hardware over the network, and link-failover mode, see *Scope*.
- The MX-ONE Media Server, is a pure software implementation which emulates the MGU board (except for the TDM interfaces). This media gateway can only be used for SIP-only scenarios.
  For instructions on how to configure the MX-ONE Media Server, see the description of *MX-ONE Media Server*.

Configure MGU Interfaces by Command

The interfaces of the MGU (both MGU board and MX-ONE Media Server) can also configured by MDSH commands set directly (used in the examples below). To configure the control interface use the `media_gateway_config` command. To configure the media interface use the `media_gateway_interface` command.

Example 1:

Configure an MGU-based media gateway for Server 2 as media gateway B. Redundancy is not used. Connect LAN0 interface of the MGU to the network (MGUs internal switch interfaces eth0 is used for control and eth2 is used for media).

Figure 1.21: Example
1
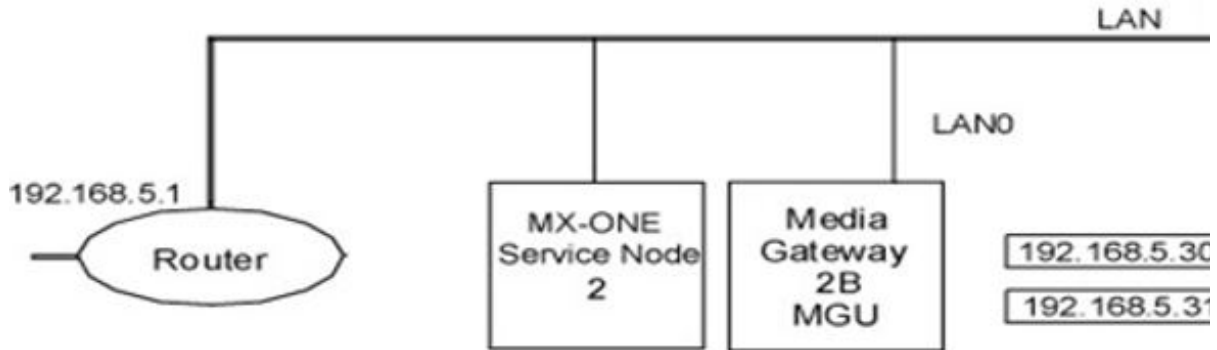
example# media_gateway_config -i -m 2B --mgw-type mgu --cidr 192.168.5.30/25 --default-gateway 192.168.5.1 --symbolic-name Stockholm

example#media_gateway_interface -i -m 2B --cidr 192.168.5.31/25 --default-gateway 192.168.5.1

Example 1

Configure a MGU-based media gateway for Server 2 as media gateway B. Link failover redundancy is used. Interface LAN0 and LAN1 should be connected to the same switched network, but to different physical switched to achieve redundancy (MGUs internal switch interfaces eth0 is used for control and eth2 is used for media).

Link failover functionality will be activated when both LAN0 and LAN1 interfaces are connected to active network switch port.

Figure 1.22: Example
2
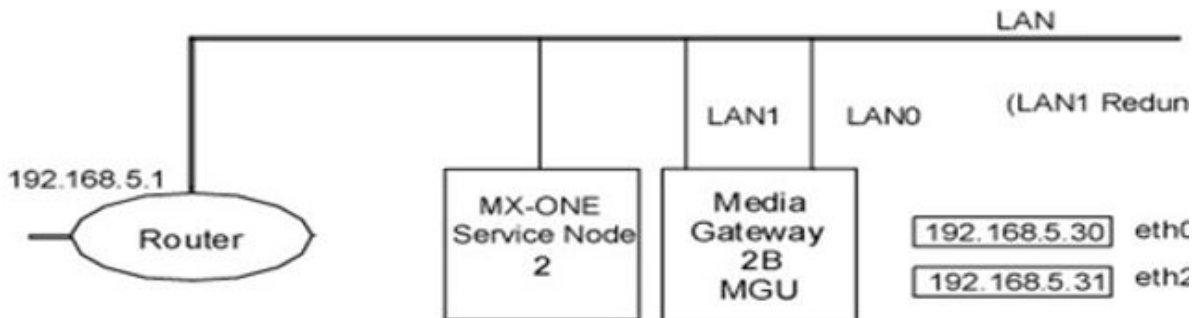
example# media_gateway_config -i -m 2B --mgw-type mgu --cidr 192.168.5.30/25 --default-gateway 192.168.5.1 --symbolic-name Stockholm

example#media_gateway_interface -i -m 2B --cidr 192.168.5.31/25 --default-gateway 192.168.5.1

Configuration Changes in Other Systems in the Private Network (Optional)

In certain installation cases, where the new system shall partly or fully replace an old system, i.e. when only part of the extensions are moved, or when several old systems are 'merged', or an old system is split in several new systems, or the move has to be done in stages, it can be relevant to do some temporary configuration changes in the old system(s) in the same private network.

The extension data will eventually be removed from the old system (or the entire old system removed), but the extension directory numbers and the extensions may temporarily be kept assigned but vacant, in order to for example re-direct calls to the new location. To do this, configuration is required in the old system(s) using the number analysis and Private Network Routing O&M functions. The extension data can also temporarily remain in the old system(s), but will then be seen as existing in other commands (like extension print commands). The procedure could be for example like this:

1. Install the new system and the extensions to be moved. Initiate the wanted tie-lines between old and new system.
    In this example, to be able to reach extensions 1000 to 1020 in the new system, the SRT should be set to 1 in the RODDI command. For example: Roddi:dest=05731,rou=<xx>,adc=<xxx>,srt=1;

2. In the old system, convert the number type of the vacant extension number to external destination: **number_vacant_conversion_initiate -number 1000..1020/ -numbertype ex -newnumbertype -ed**

3. Initiate a PNR destination to route the calls to the extension's new location. In this example the former extension number 1000 (which is now an external destination) will be addressing the number 057311000, which should lead to the extension 1000 in the new system:

    LCDDI:TAB=PNR,ENTRY=1000&&1020,FRCT=1; (to set which entries to allow in PNR). Repeat for all relevant extension numbers, if they are not in series.
    LCDDI:TAB=RCT,FRCT=1,PRE=05731; (to reach an external line via PNR).

4. The extension in the new system will now be 'active', while the extension number in the old system will be 'passive', and calls addressing that old number will be re-directed to the new system. At some time, when the move is finished, the old system should either be removed, or the extension and number data be erased.

See operational directions SMOOTH MIGRATION for more details and context.

Maintenance

To change the configuration after the installation, as root run the `mxone_maintenance` command that starts the Maintenance Utility.

NOTE: Not all the parameters can be modified after the installation.

To update the configuration, select one of the following options from the online menu:

*   Package handling — Select this option to list, add, distribute or remove installation packages.
*   Upgrade MiVoice MX-ONE Version — Select this option to list, prepare or upgrade the system to newer version.
*   Rollback MiVoice MX-ONE Version— Select this option to list or rollback the system to previous versions.
*   Repair LIM or SSH keys in system —Select this option to repair a failing LIM or ssh keys or generate network configuration for faulty server
*   Uninstall complete system, all MiVoice MX-ONE versions — Select this option to uninstall complete MiVoice MX-ONE system.
*   Server in system — Select this option to list, add and remove server.
*   LIM in system — Select this option to list, add and remove LIM.
*   Standby server in system — Select this option to list, convert free server to standby server or convert standby server to free server.

- License handling — Select this option to show hardware ID, list license usage and install new license file.
- Market settings — Select this option to list or change market setting in the system.
  CAUTION: By changing the market lots of configuration variables are set to the default for selected market. This means that you can lose a lot of existing configuration data when you change market. After changing the market, it may be required to re-configure the configurations that where lost.
- Diff serv parameters — Select this option to list or change QoS setting in the system.
  NOTE: To change Diffserv value in MGU or Media Server, refer to `media_gateway_info` command.
- Bonding settings in system — Select this option to list, add or remove bonding.
- Cluster handling — Select this option to handle clusters in system.
  NOTE: When changing a cluster, e.g. changing fallback type, adding a Server (LIM) to cluster, the cluster functionality is stopped during the reconfiguration.
- DNS forward settings — Select this option to list, change DNS forward settings, and search domains. Select this option to list, add, and remove resource records such as SRV records.
- Seccheck settings —Select this option to enable/disable security check settings.
- User management in server — Select this option to list, add, remove and change user accounts in the system. Select this option to enable/disable V.24 access to Service Node daemon.
- Web server config — Select this option to configure Web server. e.g. for MX-ONE Service Node Manager.
- Manage add-on software —Select this option to list, install, upgrade and uninstall add-on software.
- Manage SLES software repositories — Select this option to list, add and remove SLES Service Packs or Patch Packages.
- Manage Certificates and TLS settings in the system — Select this option to configure certificates and TLS settings.
- Manage settings for Media Server — Select this option to list, add and remove Media Servers.
- NTP settings — Select this option to list and change NTP server(s).

Renewing Certificates

A self-signed certificate is usually valid for 360 days. If the system is configured to use HTTPS with a self-signed certificate, the MX-ONE Service Node Manager web server will not work properly when the certificate has expired. To solve this, renew the self-signed certificate.

To renew a commercial certificate, follow the supplier instructions.

For more information about renewing certificates, see the operational directions for *CERTIFICATE MANAGEMENT*.

Changing MX-ONE Service Node IP Address and Network Name

Changing the MX-ONE Service Node IP address and network names are advanced operations that must only be performed by an experienced technician who has deep knowledge of Linux, the MX-ONE Service Node, and the Media Gateway. For more information about changing the MX-ONE Service Node IP address and network names, contact your local support.

CHANGING AUTHENTICATION Login FROM LINUX TO MX-ONE PROVI-SIONING MANAGER

When MX-ONE Provisioning Manager is installed on the same server as MX-ONE Service Node Manager, authentication method is not automatically set to MX-ONE Provisioning Manager authentication.

The authentication method for logging on to MX-ONE Service Node Manager is changed for existing MX-ONE Service Node installations.

a)Login as mxone_admin

b)Run command: sudo mxone_maintenance

c)Select Web server config option.

Authentication method is configured on the server where MX-ONE Service Node Manager (MX-ONE Service Node Manager or eri_om) is installed. Ensure that the proper protocol (HTTP or HTTPS) is chosen for the MX-ONE Provisioning Manager server. Port is automatically configured accordingly. It is important to acknowledge the re-start of mxone_jboss service after the configuration process, otherwise, the changes do not have any effect.

Increasing Heap Memory Size in Jboss Configuration File

Follow the steps below for increasing the heap memory size in Jboss configuration:

1. Login to Provisioning Manager/ SNM server with root user credentials.

2. Go to path: `cd /opt/jboss/bin`

3. Edit *standalone.conf* file and change the options Xms256m and Xmx256m to the desired values. In the example below, options are changed to 2048m.

```
JAVA_OPTS="-Xms2048m -Xmx2048m -XX:MaxPermSize=256m
-Djava.net.preferIPv4Stack=false -Djava.net.preferIPv6Addresses=true"
```
```
JAVA_OPTS="$JAVA_OPTS
-Djboss.modules.system.pkgs=$JBOSS_MOD-ULES_SYSTEM_PKGS
-Djava.awt.headless=true"
```
```
JAVA_OPTS="$JAVA_OPTS -Djboss.modules.policy-permissions=true"
```
```
JAVA_OPTS="$JAVA_OPTS -Djboss.as.management.blocking.timeout=600"
```

4. Save the changes.

5. Run `webserver_config` command.

6. Select **Re-start webserver** option.

NOTE: Be aware that although Jboss is replaced with Wildfly but still the Jboss name is used in the commands and location information.

Redundancy Considerations

Prerequisites

- The standby Server (LIM) must have enough performance to be able to take over from an arbitrary Server in the cluster.
- The standby Server must have enough hard disk memory to be able to store two data backups of each Server included in the cluster. A data backup normally requires around 100 MB of disk space.
- Within a cluster there must be enough bandwidth to efficiently transmit data backups to the standby server.

NOTE: For reference, see the Redundancy section of the description for *MX-ONE SYSTEM PLANNING*.

General

The MX-ONE Servers can be connected to a redundant network, using Ethernet bonding.

Certain features, like for example, operator queue and ACD backup group, can be duplicated and placed in different Servers. This increases the reliability for specific features.

Server redundancy means that a standby MX-ONE Server takes over the failing Server's identity, including the IP address (the alias address), and will continue to act as Service Node (LIM). The media gateways of the failing server will be controlled by the standby server.

At server redundancy the servers are assigned both real and alias IP addresses. When a Server goes down, the alias addresses of the failing Server are moved to the standby server. The Service Node is reloaded and started on the standby server using the Server number of the failing Server.

The standby server will take over any failing servers identity and continue execution of call processing. It is recommended that the standby server is of the same type as the failing server.

To achieve server redundancy the Servers are arranged in clusters. A cluster is a number of Servers with one designated standby Server. The MX-ONE can have a maximum of 10 Servers per cluster.

The HLR backup/redundancy feature provides a possibility for H.323 and SIP extensions to temporarily register, on certain conditions, to a backup HLR in another server (LIM) than the ordinary HLR server (LIM).

You can use several Cassandra database centers but you must have to connect 1 Cassandra database node per Data Center, which could be a co-located one with a Service Node or standalone.

Limitations

This section lists the known limitations with the redundancy solution in MX-ONE that must be considered when deploying both network and server redundancy.

Network Redundancy

- When the MX-ONE Media Server is used, the redundancy functions of the server on which the MX-ONE Media Server is running will be valid.
- With Ethernet bonded network redundancy, it is recommended to define at least two ARP IP targets per server. If only one ARP IP target is specified and that target is unreachable communication will

change back and forth between the interfaces. If this happens it will most likely lead to lost IP packets and fatal disturbances in the server communication.

Server Redundancy

- For performance reasons, a backup cluster cannot include MX-ONE Service Nodes (LIMs) in different geographical areas.
- If a Server does not belong to any backup cluster, for example, a remote Server, it will not have any server redundancy.
- If several ordinary servers in the same cluster fail, the MX-ONE Service Node with the highest priority will execute on the standby server. If one Server is running on the standby server when another MX-ONE Service Node with higher priority fails, the MX-ONE Service Node with highest priority will finally execute on the standby server. The other failed MX-ONE Service Nodes will not operate.
- If automatic fallback is configured for the cluster, the fallback will take place when the server is functioning again. This can create problems if the regular server goes up and down repeatedly during a short period of time.

HLR Backup/Redundancy

- HLR backup is supported for H.323 and SIP extensions, but requires support for load distribution (for H.323) or DNS SRV (for SIP) in the terminals.
- While registered to a backup HLR, several services cannot be utilized by the user. For example group functions, queue function, monitoring, and charging functions.
- IP end points that do not support periodic re-registration and load distribution mechanisms cannot have the HLR backup feature.

Configuration

Server Redundancy

When server redundancy is used alias addresses are set for the ordinary MX-ONE Service Nodes in the cluster.

The alias addresses should belong to the same subnets as the ordinary IP addresses. Address symmetry is recommended to facilitate maintenance.

Figure 1.23: Server redundancy without network
redundancy
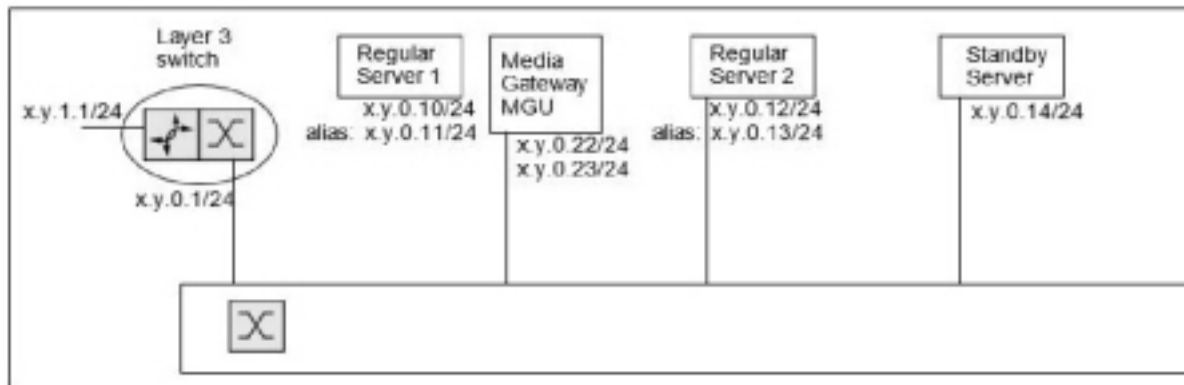
Server redundancy can also be used in a Ethernet bonded network, see figure below. For more informa-
tion, see *MX-ONE System Planning*.

Figure 1.24: Server redundancy with Ethernet bonded network
redundancy
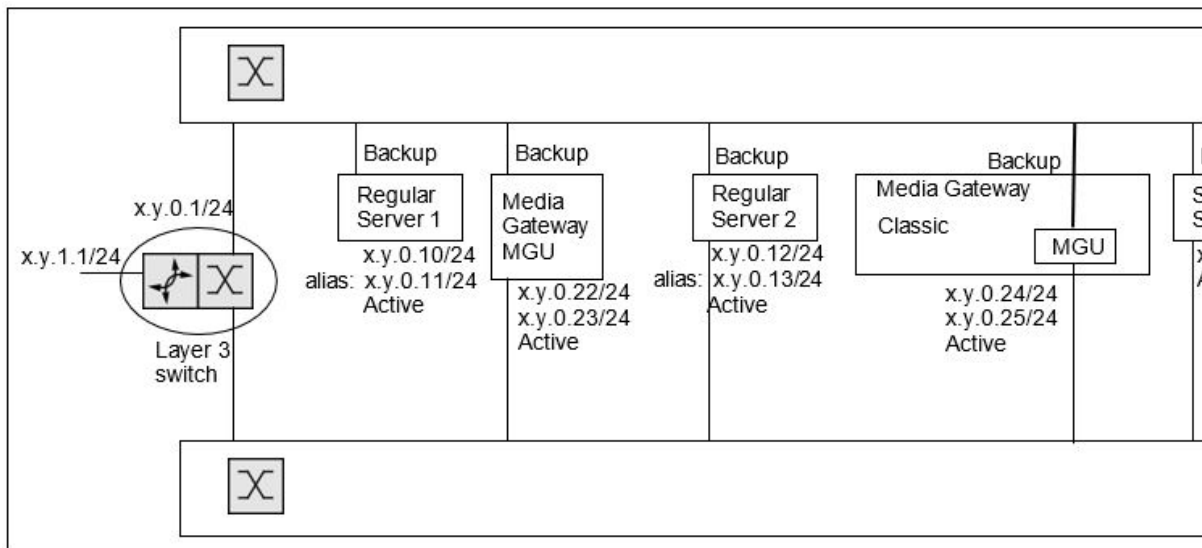
The following entities should be setup to the alias server addresses:

- IP extensions (H.323 and SIP)
- Media Gateway (for the NFS server)
- CSTA
- Operator Work Station (NOW)

HLR Backup/Redundancy

When HLR backup shall be used, activate the service by the `ASPAC` command with parameter 198
(`PARNUM = 198`).

Configure the IP terminals and the DNS server appropriately, to support load balancing.

Other Services

DNS

The internal DNS of the MX-ONE System is configured automatically at installation. Here, the base addresses are used. The internal DNS must not be modified.

If the user wants DNS entries for phone server records the address to the customer local DNS should be specified.

GICI

GICI is not affected by redundancy, as the MX-ONE Service Node is connected as a client to the GICI server. The GICI server should be located on the same side of the router as the IP phones.

NTP

The clock time on any of the MX-ONE servers should not be changed manually, because MX-ONE uses NTP to synchronize the system clocks of all the servers.

NOTE: Manual change of time or date on any MX-ONE server should not be done.

Certain legacy features with common functions.

There are a few usually optional legacy features that have common function programs, which in 2-server systems are only loaded in one server (the non-I/O server) as default. Those features are:

- TDM-DECT (CF program unit CTLM)
- Paging (DPM)
- CCSS7 trunks (MTM)
- Route optimization/Path Replacement for ISDN/DPNSS (ROM)
- Traffic Recording (TMM1, TMM2)
- SOM (ZODBM, ZOHC, ZOMM)

In such systems, you can improve redundancy for those features by manually loading the mentioned specific program units, and also in the second server. In systems with 3 or more servers, these common functions get loaded in 2 or more servers.

MGU Board Setup

General

To access the MGU board over the network the IP address of its control port on LAN 0 must be set. When using network redundancy, link-failover mode should also be set.

The following Ethernet ports are available, see the following table.

Table 1.5: MGU ports (Sheet 1 of 2)

	LAN 0	LAN 1 (redundancy)
Control	eth0	eth1

Table 1.5: MGU ports (Continued) (Sheet 2 of 2)

Media	eth2	eth3

Prerequisites for MGU Boards

- Root authority is needed to access the MGU console.
- Make a terminal connection to the USB port in the front of the MGU.
  Use cable TSR 899 135/1, which is a USB to D-Sub cable, plus a 9 pin D-Sub female to female adapter.
  Use a terminal program, for example, **kermit**.
- Baud rate is set to 9600 bits/sec, 8 data bits, no parity, 1 stop bit.
- No HW or SW flow control.
- If run with kermit on a MX-ONE Service Node a control file, kermitrc, is needed under /root with the following content:
  - set line /dev/ttyS0
  - set speed 9600
  - set transmit prompt 46
  - set take echo on
  - set carrier-watch off
  - set flow none
  - connect
- The default address for eth0 is: **192.168.1.2/24**

Setup Network, Passwords, and Link-failover Mode

1. Login with user: **admin**, password: **admin**.
2. Change password for admin.

   NOTE: You will get a warning, and be prompted to change the password:
3. Switch to root, by: **su -**

   The default password is: **root**.
4. Change password for root.

   You will get a warning, and be prompted to change the password
5. Follow the on-screen instructions.

   NOTE: Use the `mgu-setup --help` command for guidance.

The process is completed in the MX-ONE Service Node Manager where it is mandatory to set the media ports. This is followed by a reboot.

Boot Parameters

When the MX-ONE Service Node has sent the board parameters and the reboot is done, the set parameters can be checked. Use the `nvparams -dispar all` command:

The following parameters can, for example, be displayed:

Table 1.6: Boot parameters

Parameter name	Default or (Example)
*ROF_num	ROF 137 6304/x
*ROF_rev	Rxx
*ROF_ser	T01xxxxxxx
*eth0_mac	(00:13:5E:F0:AD:C4)
*eth1_mac	(00:13:5E:F0:AD:C5)
*eth2_mac	(00:13:5E:F0:AD:F6)
*eth3_mac	(00:13:5E:F0:AD:F7)
eth0_ip	192.168.1.2/24
eth1_ip	192.168.2.2/24
eth2_ip	192.168.1.3/24
eth3_ip	192.168.2.3/24
nfsroot	/mgu_root
lilo_arg	root=/dev/mtdblock1 rw rootfstype=yaffs2 noatime
autoupdate	no
nfs_server	192.168.1.10
def_route	192.168.1.1
def_route1	192.168.2.1
autostart	(yes)
phy0_mode	(AUTO)
phy1_mode	(AUTO)
lan_active	(BOTH)
lan_monitor	(BOTH)
lan_primary	(LAN0)

Installation Test for MiVoice MX-ONE

This section describes installation test at the end of the installation procedure.

To check functionality for the MX-ONE proceed as follows:

1. Make a call from an IP telephone to another IP telephone.
2. Make a call from an IP telephone to an analog telephone.
3. Make a call from an IP telephone to an external number.
4. Make a call from an external number to an IP telephone.
5. Make a call from a digital telephone to another digital telephone.

Installation - Virtual Appliance

The virtual appliance installation for MX-ONE is discussed in this topic. See also, *Installaing and Configuring MiVoice MX-ONE*.

General

This document describes the usage of the MX-ONE Service Node (SN) packed as a Virtual Appliance for VMware vSphere/ESXi.

If an existing MiVoice MX-ONE system has used Turnkey Solution installation (with hardware), and shall be changed into a Virtual Appliance installation, that has to be done as a new installation with Virtual Appliance.

Glossary and Acronyms

For a complete list of abbreviations and glossary, see the description for ACRONYMS, ABBREVIATIONS AND GLOSSARY.

Prerequisites

- The vSphere Client installed on a workstation.
- VMware ESXi 7.0 host (minimum version 5.5) or a vCenter solution, recommended version is VMware ESXi 6.7 or later shall be used.
- The MX-ONE Service Node Virtual Appliance file.
- Good knowledge of VMware vSphere.
- Good knowledge of SLES12 and MX-ONE installation.
- Read the *MiVoice MX-ONE SYSTEM PLANNING description*, and the description *VIRTUALIZATION FOR MIVOICE MX-ONE 7.0 or later*.

NOTE: For database (Cassandra) server VMs, co-located or stand-alone, SSD disks are required.

Execution

The procedure involves the following 3 major tasks:

1. Importing the Virtual Appliance to:
    – a single ESXi host, or
    – a vCenter cluster

2. Post-configuring a newly imported MX-ONE virtual machine

3. Installing and Configuring MX-ONE

Importing the Virtual Appliance

This section describes how to install the MX-ONE Service Node Virtual Appliance on a virtual machine.

Importing on a Single ESXi Host (From ESXi 6.5)

This section describes how to install the MX-ONE Service Node Virtual Appliance on a single VMware ESXi host through the VMware host client. This scenario applies to the free version of ESXi.

1. Log in directly to the ESXi host through the VMware Host Client (via Web browser enter the IP address/FQDN of the ESXi host).

2. Click Host and from the main menu, select Create/Register VM. A wizard opens that will assist in the deployment process. in the first step, select the Creation Type and select Deploy a virtual machine from an OVF or OVA file.

3. On the next page, specify a name for the virtual machine and select the OVF and VMDK files or the OVA for the VM you want to deploy.

4. Select a data store for the virtual machine. It could be either local or centralized (SAN).

5. Map the networks used in this OVF to networks in your inventory, select disk format for the virtual disks. Thick provisioning allocates all space at once, thin allocates on demand. Thick gives a slight performance gain and eliminates the risk of over-shooting actual storage space.

6. You will get a summary page to review your settings selection before you exit the wizard and proceed to start the deployment.

7. Click Finish to start the deployment task.

Importing on a Single ESXi host (From ESXI 6.0 Or Earlier)

This section describes how to install the MX-ONE Service Node Virtual Appliance on a

single VMware ESXi host through the vSphere client. This scenario applies to the free

version of ESXi.

1. Log in directly to the ESXi host through the vSphere client.

2. From the File menu, select Deploy OVF Template....

3. A wizard opens that will assist you with deployment process. In the first, select the Virtual Appliance file. Next page shows some information about the Virtual Appliance.

4. Specify a name and location for the deployed template.

5. Select a data store for the virtual machine. It could be either local or centralized (SAN).

6. Select thick lazy zero provisioning as the disk format for the virtual disks.

7. Map the networks used in this OVF to networks in your inventory.

8. All done - click Finish to start the deployment task.

Importing into a vCenter cluster

This section describes the import process of a MX-ONE Service Node Virtual Appliance in a VMware vCenter cluster environment.

Such an environment contains multiple hosts, centralized storage, and distributed network and supports the vCenter features such as vMotion, High Availability (HA), and Fault Tolerance (FT).

1. From the vSphere client or vSphere Web client, log on to the vCenter server.

2. If you are importing on a vSphere client, select from the File menu and select Deploy OVF Template.... A wizard opens that guides you through the deployment process.Select the Virtual Appliance file to import.

3. A page opens showing information about the Virtual Appliance.

    a. Select the Virtual Appliance file to import. A page opens showing information about the Virtual Appliance.
    b. Enter a name for the virtual machine, and also, select the datacenter where it should be used.
    c. Select the host or cluster that should handle the new virtual machine. A review page with data about the Virtual Appliance is displayed.

4. If you are importing on a vSphere Web client, right- click on the vCenter server and select Deploy OVF Template.... A wizard opens that guides you through the deployment process.

    a. Select the Virtual Appliance file to import.
    b. Enter a name for the virtual machine, and also, select the datacenter where it must be used.
    c. Select the host or cluster or resource pool or vapp where to run the new virtual machine. A review page with data about the Virtual Appliance is displayed.

5. Select datastore for the virtual machine. Choose a centralized storage (SAN) if HA/FT will be used.

6. Select the virtual network the virtual machine must connect to. In a clustered environment, this is normally a Distributed Switch. Be sure that switch is connected to the production/telephony network

7. Select the disk format for the virtual disks. If FT will be used, or thick provisioning must be selected. For other cases, select any format (you can keep the default selected).

8. Select the virtual network the virtual machine must connect to. In a clustered environment, this is normally a Distributed Switch. Be sure that switch is connected to the production/telephony network

9. With this all, necessary information is now collected. Click Finish to start the deployment task.

After you finish importing a Virtual Appliance by using a single ESXi host or a vCenter cluster, you will have a MX-ONE Service Node in turnkey state. At this moment, the server is not yet configured and is generic (it has not yet been assigned any specific function). Starting up the virtual machine triggers the turnkey installation process, which is identical to the one used for physical MX-ONE servers. If more than one MX-ONE Service Node is needed, just run the process above multiple times using the same Virtual Appliance file. Give each virtual machine an unique name and distribute them over the hosts in the cluster (how depends on the cluster setup, the amount of servers inside the cluster and the load on the hosts)

Post-Configuration of a Newly Imported MX-ONE VM

Before using a newly imported MX-ONE virtual server, some settings must be considered and maybe changed. These are mainly related to processor and memory allocation

- Hardware - Memory

The amount of memory the virtual machine is equipped with. The value must be changed according to the system size and the MX-ONE application that the server will run, e.g. Service Node, Service Node Manager, Database (Cassandra), Provisioning Manager and Media Server. For configuration and planning of virtualization, see the description *VIRTUALIZATION FOR MIVOICE MX-ONE 7.0 or later.*

- Hardware - CPU

By default, two CPUs are allocated to the virtual machine. If you plan to use Fault Tolerance together with the MX-ONE Service Node, this must be changed up to 8 vCPUs. Also, numbers of CPUs needed in a server depends on desired performance and system size. For configuration and planning of virtualization, see the description VIRTUALIZATION FOR MIVOICE MX-ONE 7.0 or later.

- Options - Paravirtualization

This must be disabled on Fault Tolerance-enabled virtual machines as it is not supported. On all other configurations, keep this enabled.

- Resources - CPU

This setting affects the resource allocation in the cluster/host. This must be configured to match required performance of the MX-ONE and the capacity of the cluster/host and how many virtual machines are running in parallel.

- Resources - Memory

As for the CPU-resources, this setting depends on the capacity needed, the cluster/host configuration and how many other virtual machines are running in parallel.

- Disks

For database (Cassandra) server VMs co-located or stand-alone, SSD disks are required.

NOTE: Be sure that the network configuration of the virtual machines is properly set up in the cluster. By default, the standard "VM Network" is used. In a cluster environment where distributed switches are used (a requirement if HA/FT is used), this must certainly be changed.

Installing MX-ONE on Hyper-V

The Microsoft hardware virtualization product, Hyper-V lets you create and run a software version of a computer, called a virtual machine. Each virtual machine acts like a complete computer, running an operating system and programs. The following are the requirements of the virtual machine.

- It can be installed on Windows Server (2019, 2016)
- It requires only a Windows license and no specific license is required.
- Windows Server can be installed on a Dell or an HP server.It is similar to VMware in its functioning.
- It uses .vhd and. vhdx format image for installation.
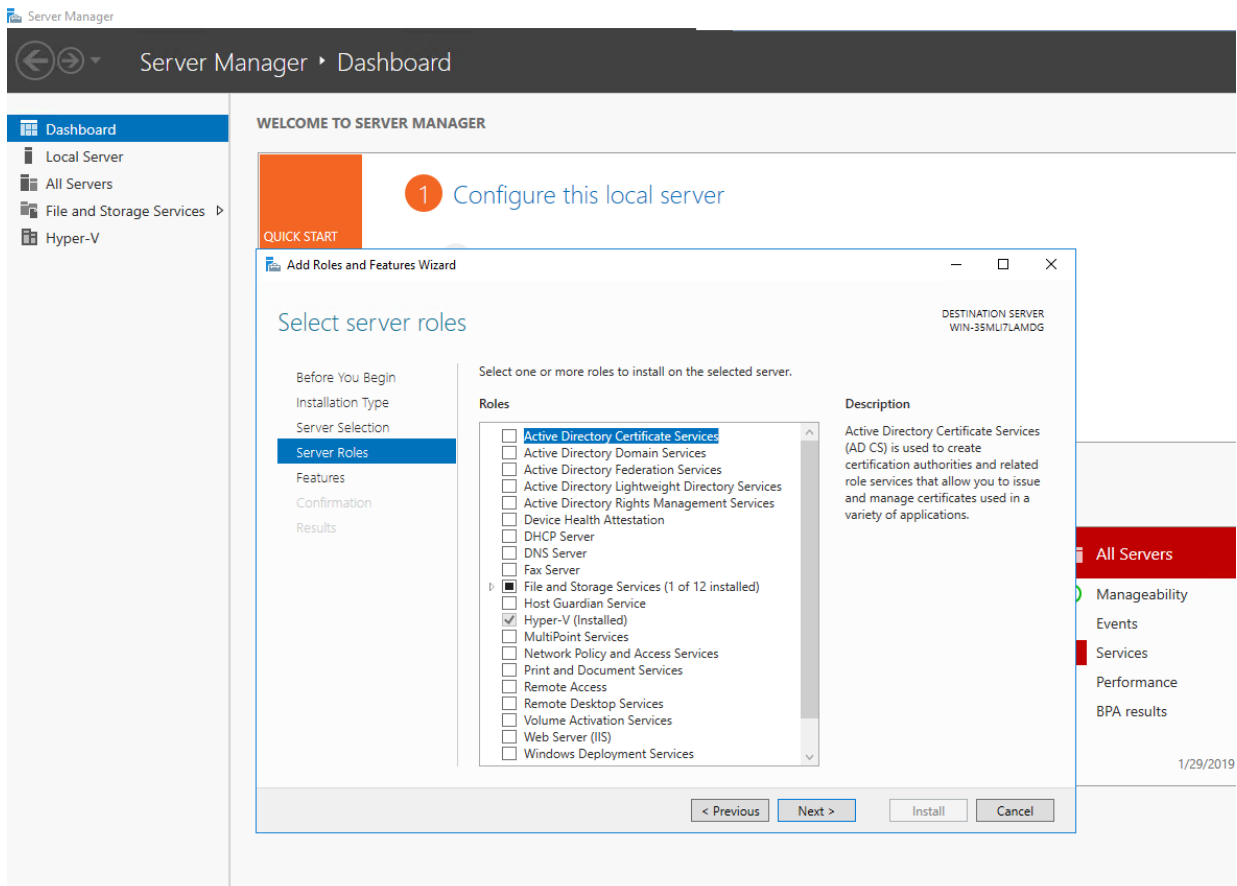
To install MX-ONE on a Hyper-V setup:

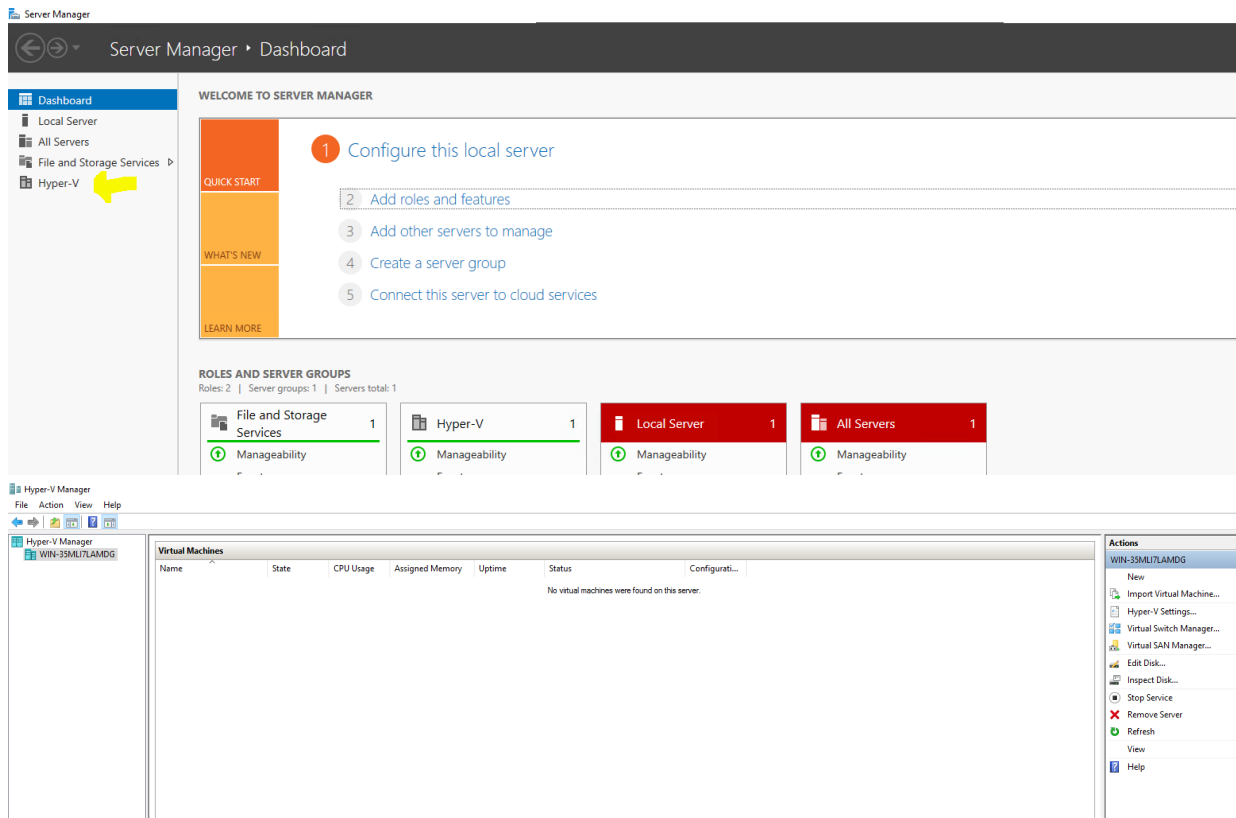Once the Windows Server get successfully installed,

1. Enable Hyper-V using PowerShell.

    a. Open a PowerShell console as Administrator.

    b. Run `Enable-WindowsOptionalFeature -Online -FeatureName Microsoft-Hyper-V -All` command to install Hyper-V.
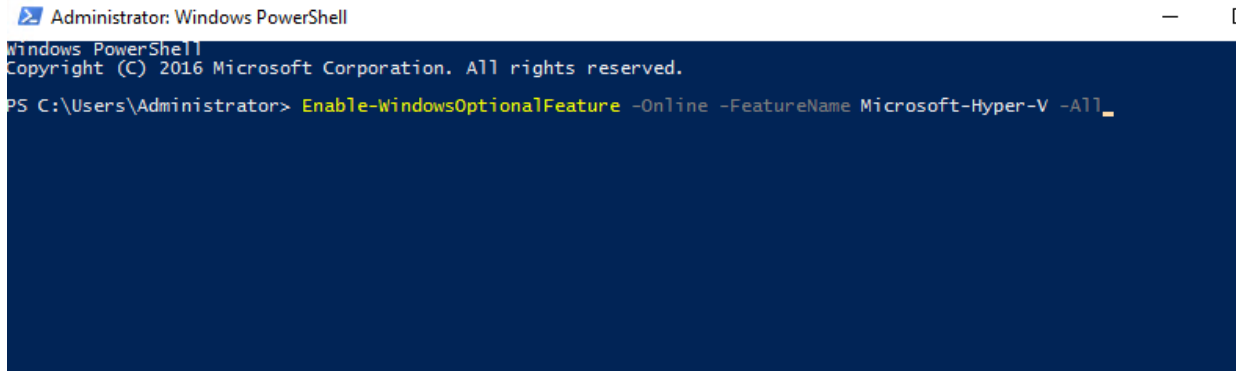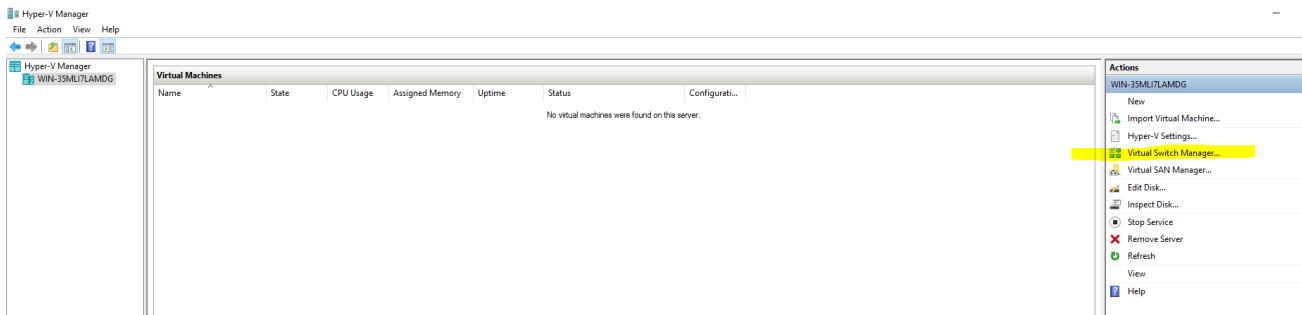

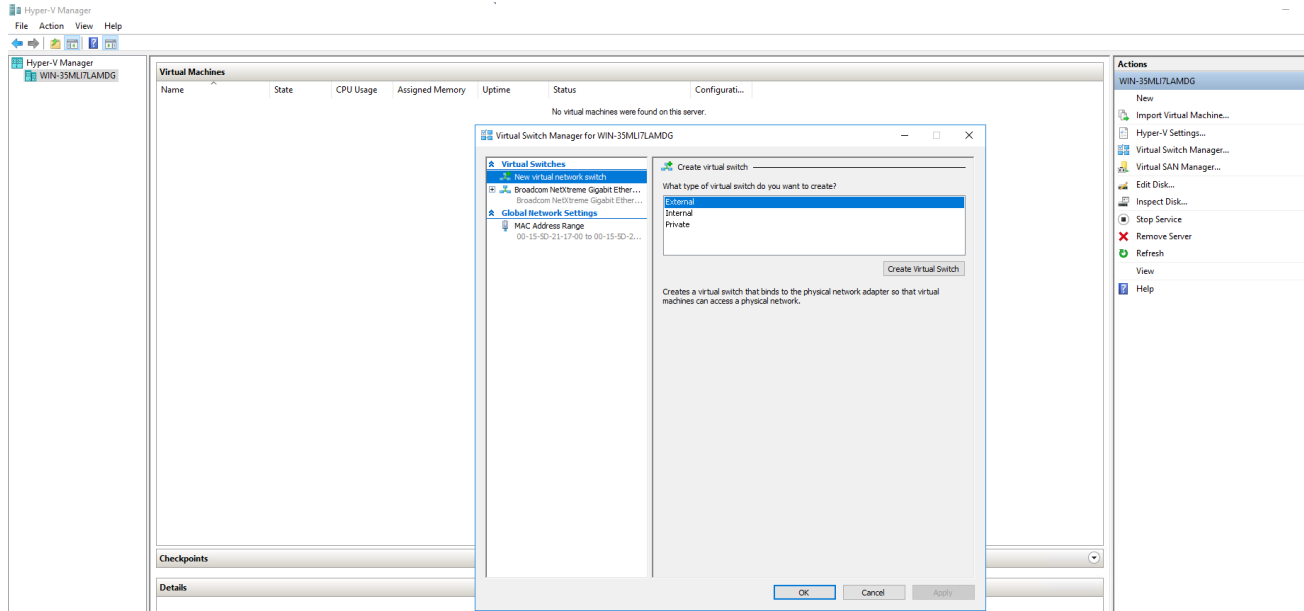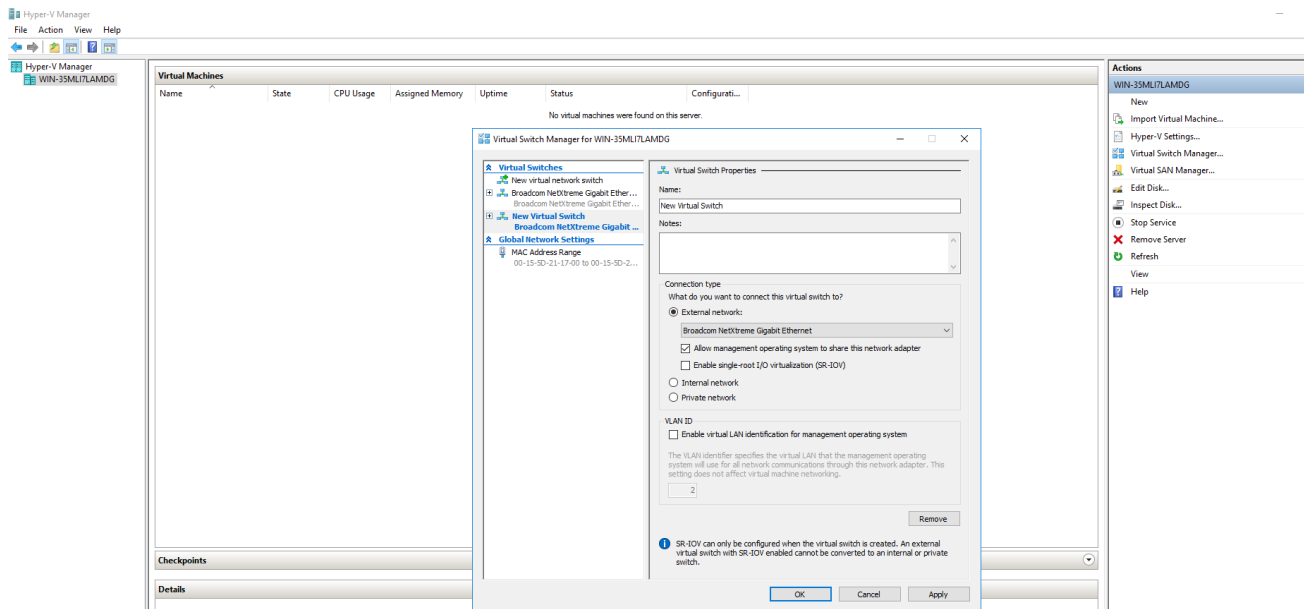   c. Or you can open the service manager - Add role and features and install Hyper-V.

2. Before you install, create a Virtual Switch Manager for Hyper-V to give network access to the virtual machines.
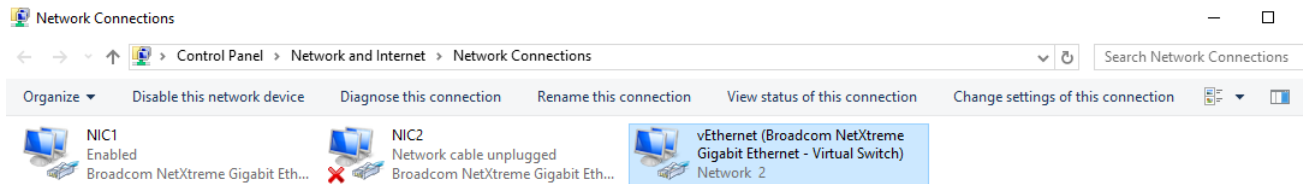
3. Select Virtual Switch Manager from the right pane

.

4. Select the type of switch, in this case, an External
Switch.

5. Enter a Name for your switch and click
Apply.

6. Your configured Network Switch is listed in the Network Connections.

7. Create a virtual instance.

8. Select **New > Virtual Machine**.
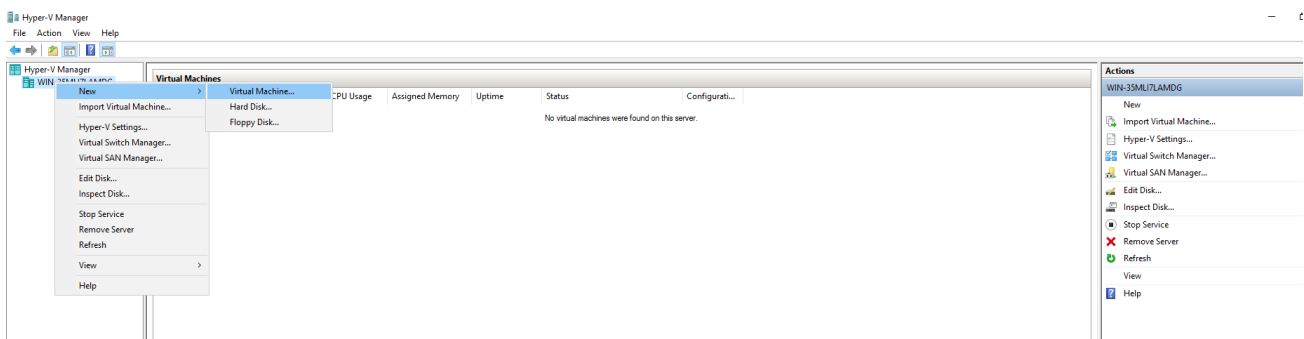
9. Enter the virtual instance name and click **Next**.
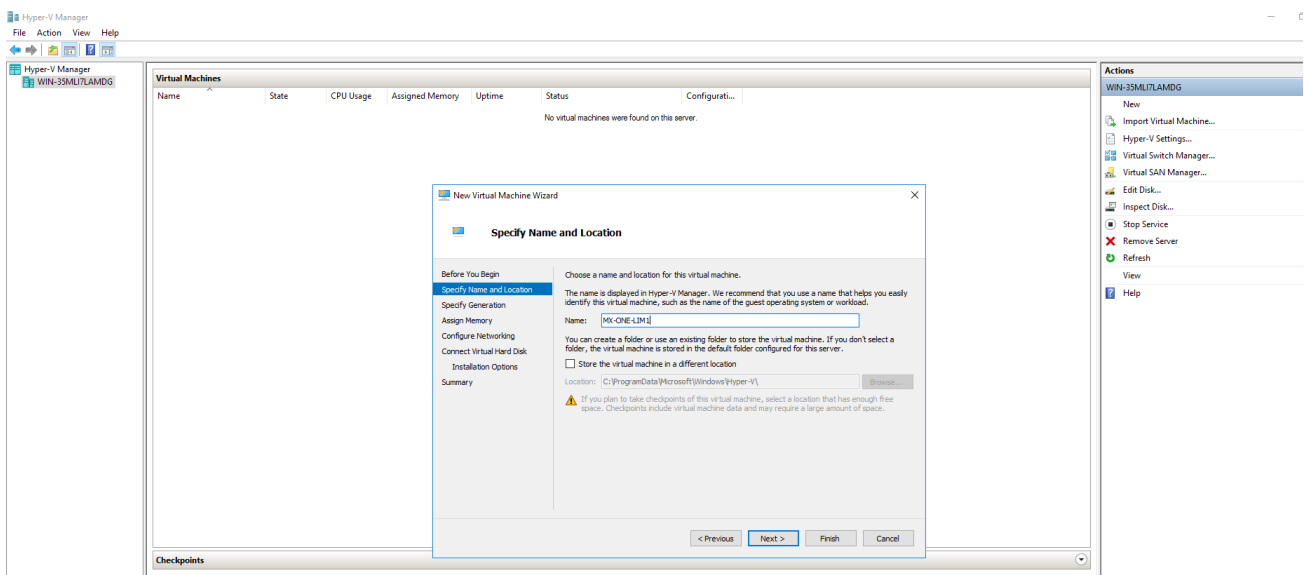
10. Assign memory as per the requirement and click
Next.
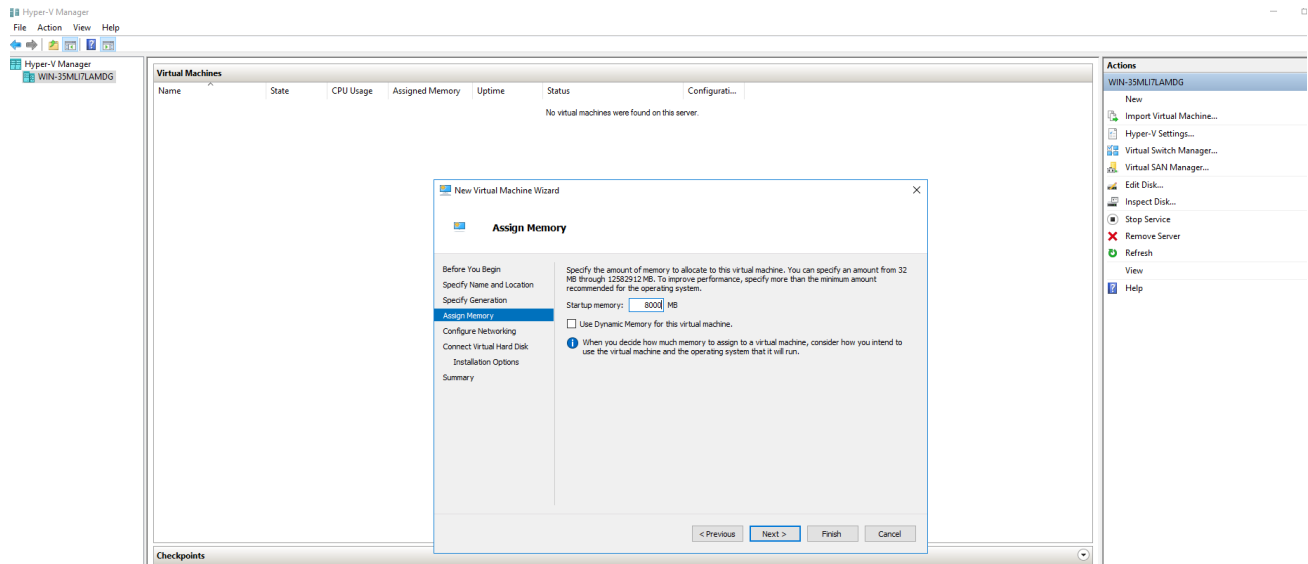
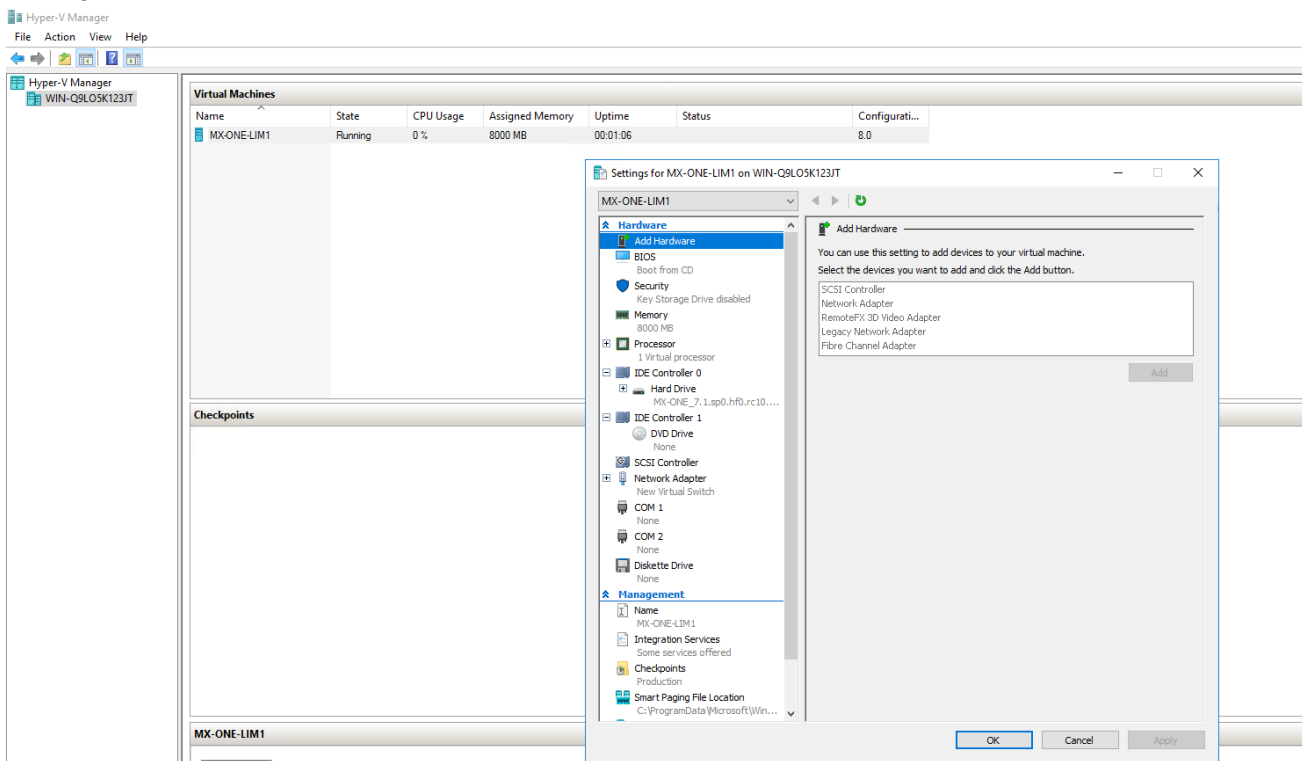**11.** Select the Network Switch which you have configured initially and click
Next.
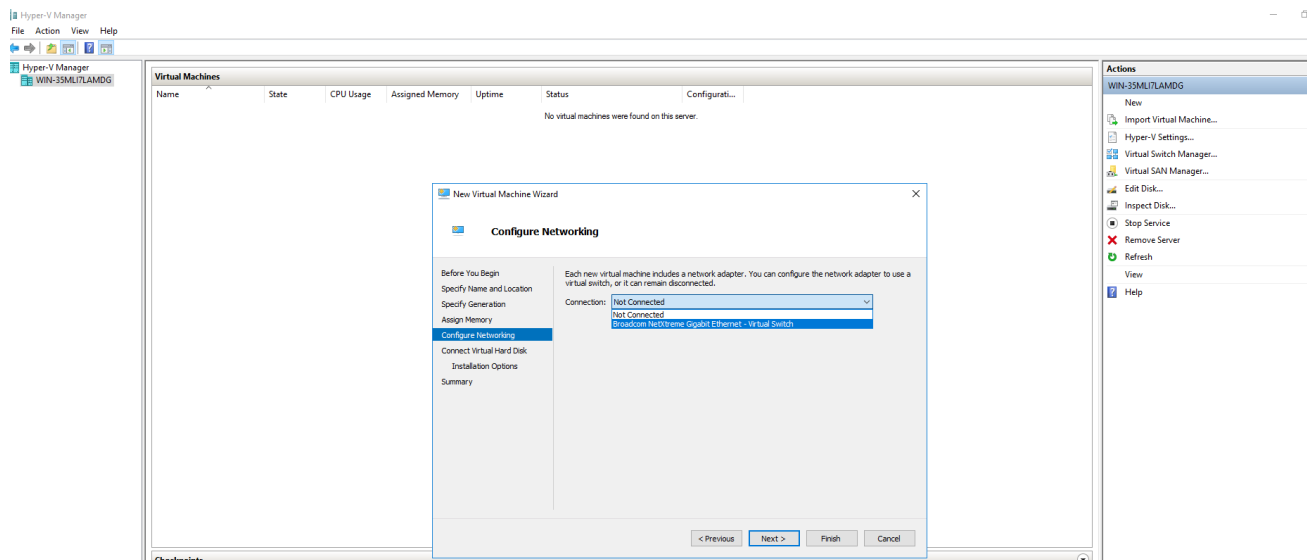
12. Select the image (VHD) by selecting the option, **Use an existing virtual Hard disk** and select the location where your VHD image is stored (In case of MX-ONE Unzip the Hyper-V Image and select the Virtual Hard Disk
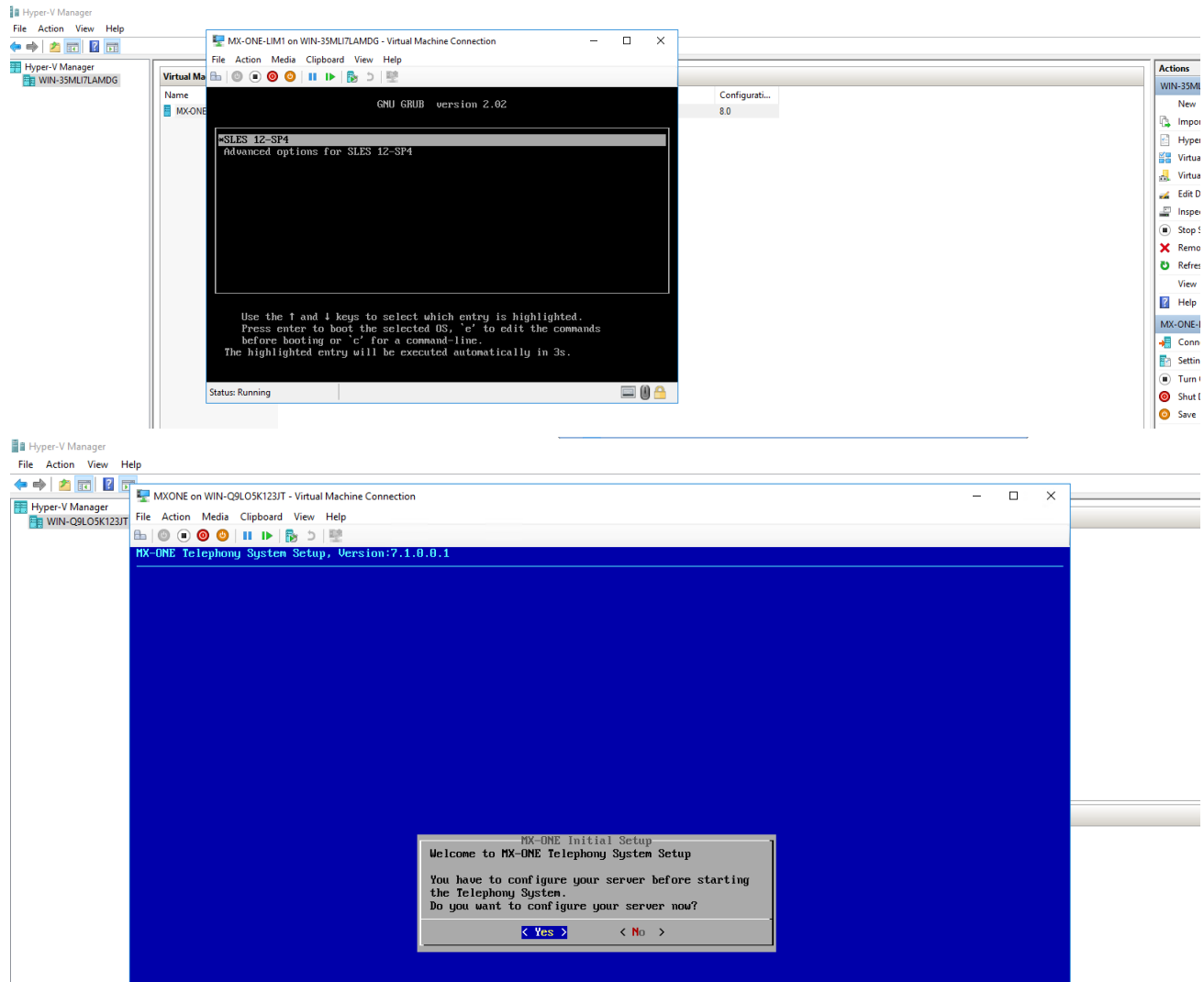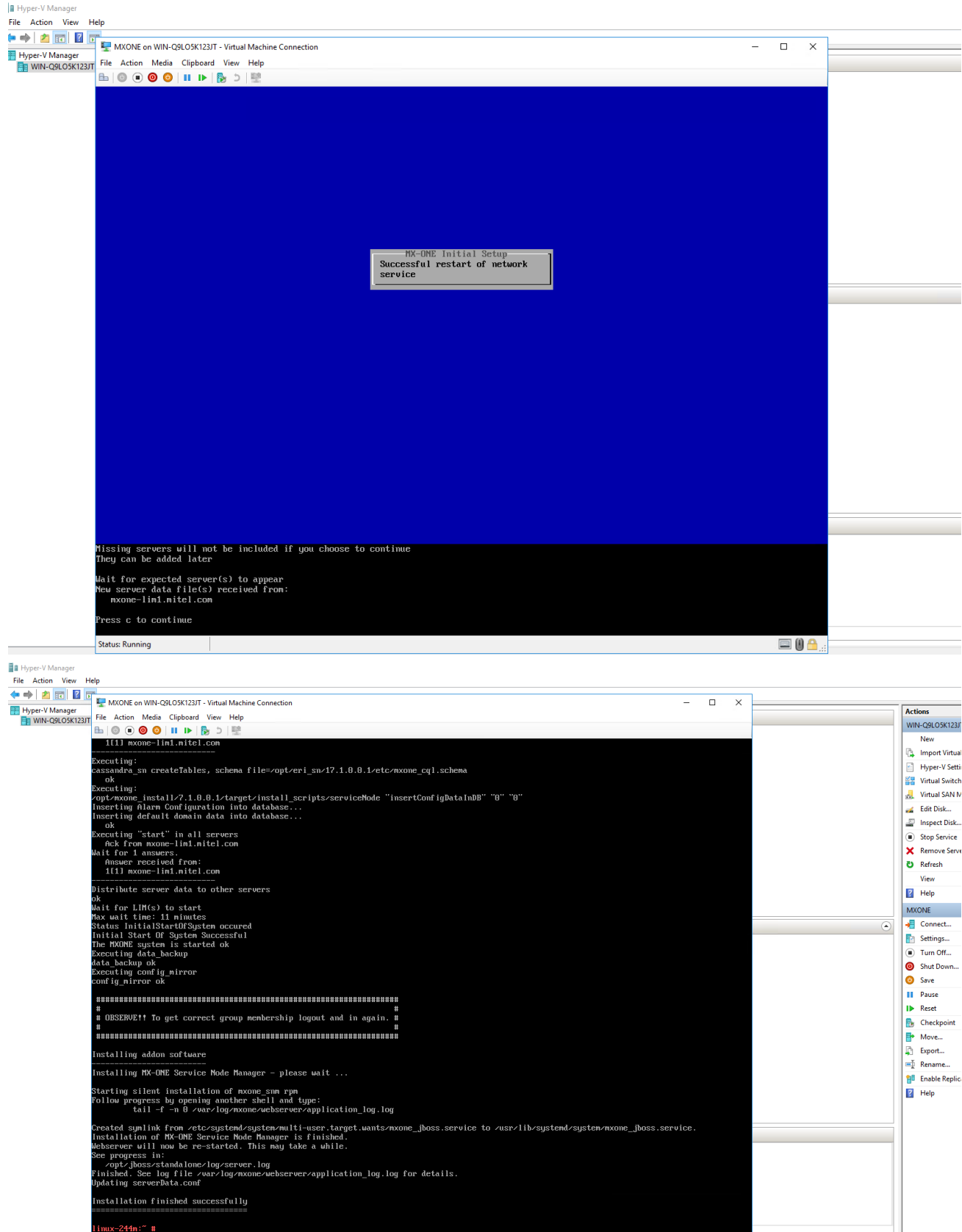).
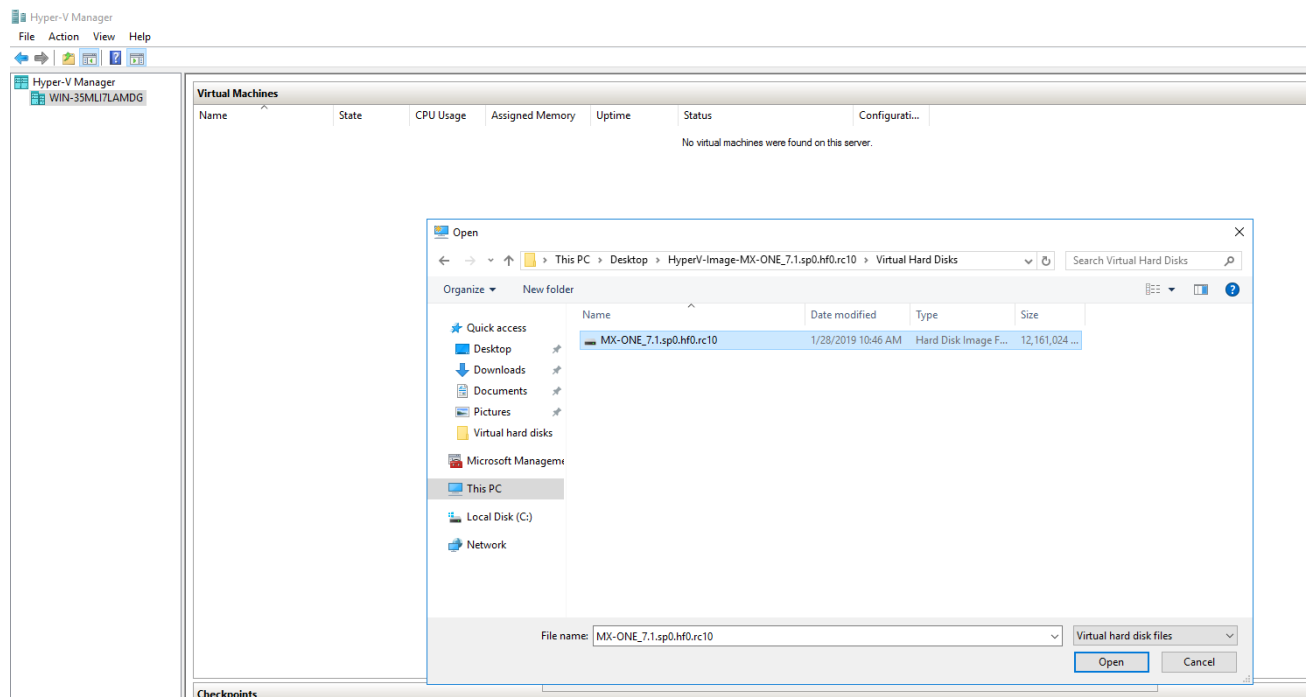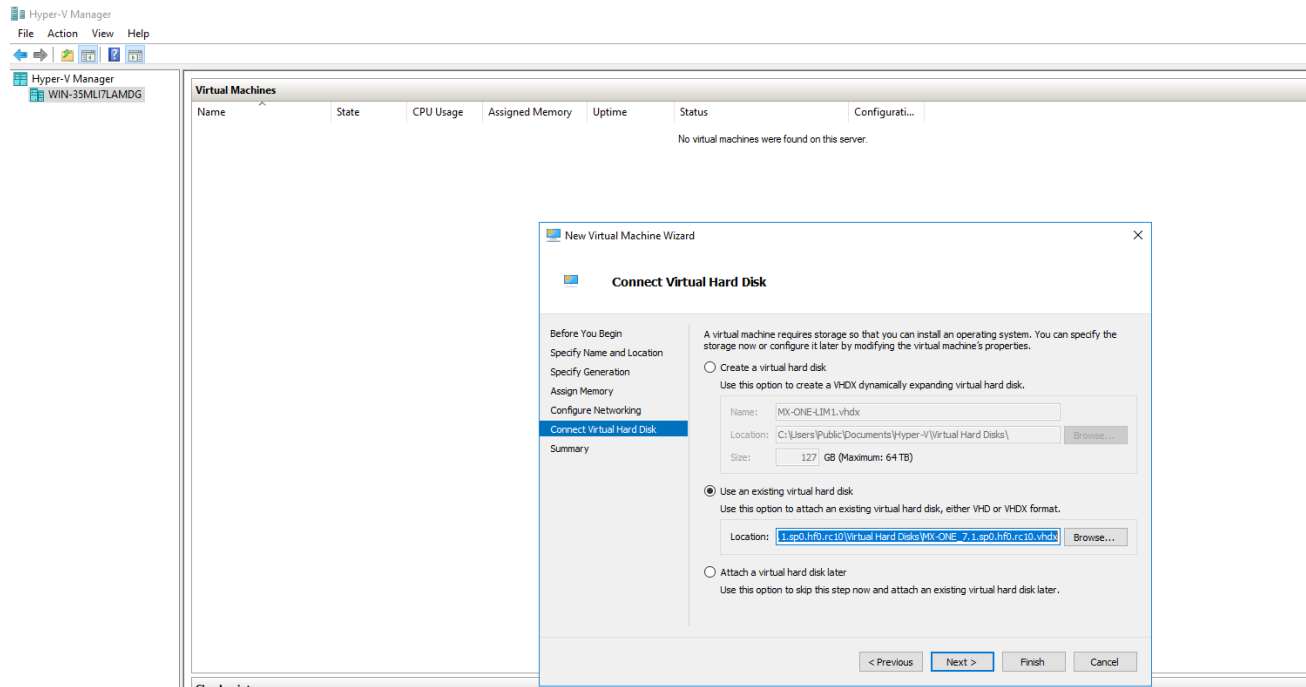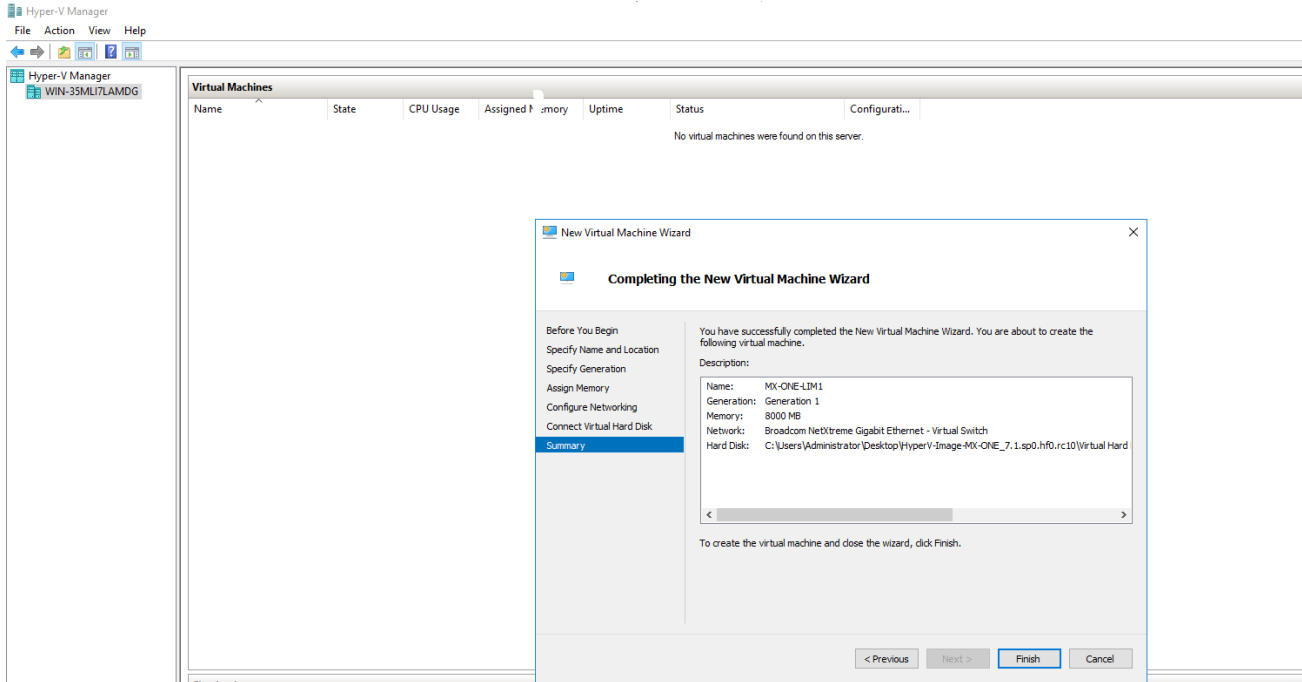
13. Change system settings.

14. Start the machine and install MX-ONE setup as shown in the following figures.
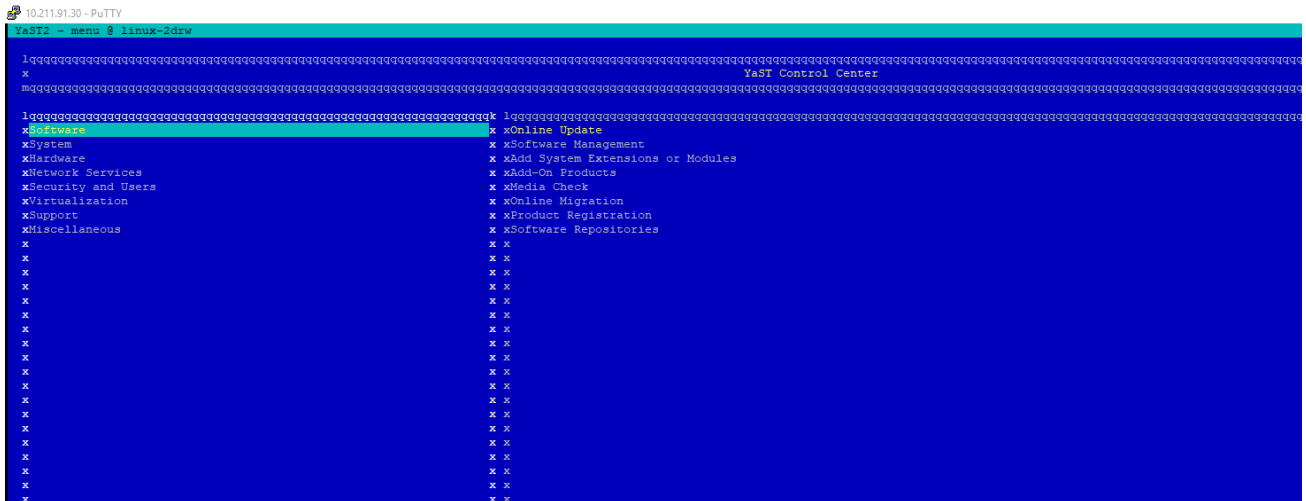
Installing MX-ONE KVM, SuSE Linux

To install MX-ONE on the Kernel-based Virtual Machine (KVM) on the SuSE Linux platform, follow these steps:

1. Download the MX-ONE ISO image (Recovery image) from the MX-ONE repository.

2. Make a bootable USB and load it with the Recovery image to install OS with KVM capability.

3. Run the USB and select option 3 (KVM install).

4. Install the KVM image and system is restored with SuSE Linux installed.

5. Enter the root login credentials.

```
login as: root
Using keyboard-interactive authentication.
Password:
Last login: Tue Apr  9 08:31:21 2019 from 10.210.30.207
linux-2drw:~ #
linux-2drw:~ #
```

6. Using the Yast utility, enter IP address, Gateway, DNS and subnet Mask to the system. For more information see,
https://www.suse.com/documentation/sled11/book_sle_admin/index.html?page=/documentation/sled11/book_sle_admin/data/sec_basic-net_yast.html.

7. Using the configured IP address login to the terminal using putty.

8. For the installation of KVM over SuSE download the. qcow2 and .xml files from the package repository.

9. Check if `libvirtd` is running or not, else start it: `sudo systemctl status libvirtd`

```
   libvirtd.service - Virtualization daemon   Loaded: loaded
   (/usr/lib/systemd/system/libvirtd.service; enabled; vendor preset:
   enabled)   Active: active (running) since Mon 2019-04-08 14:38:40 CEST;
```

```
22h ago     Docs: man:libvirtd(8)          https://libvirt.org Main PID:
21036 (libvirtd)     Tasks: 18 (limit: 32768)    CGroup:
/system.slice/libvirtd.service          ??21036 /usr/sbin/libvirtd -listen
```

10. Create a virtual machine, enter `virt-clone --original-xml Virtu-al_Image-MX-ONE_7.0.sp0.hf2.rc5.xml --name <your system name> --file /local/images/<your system name>.qcow2`

    For example, `virt-clone --original-xml Virtual_Image-MX-ONE_7.1.sp0.hf0.rc26.xml --name MX-ONE --file /local/MX-ONE.qcow2`

    NOTE: Keep the qcow2 and xml under the local folder. Edit (vi) the xml file and change the default path from /kvm/images to /local where you have saved the image file.

11. When the kvm image installation is complete, create a network bridge and map it to the `eth0` that you are using so that KVM can access it.

12. To add a new network bridge device on VM Host Server with `brctl`, follow these steps:

    a. Log in as root on the VM Host Server where you want to create a new network bridge.

    b. Choose a name for the new bridge-VIRBR_TEST in our example- and run `root # brctl addbr VIRBR_TEST`.

    c. Check if the bridge was created on VM Host Server `root # brctl show`

    ```
    bridge name    bridge id         STP enabled    interfacesbr0
    8000.e06995ec09e8   no         eth0virbr0       8000.525400b37ec9
    yes            virbr0-nicvirbr_test     8000.000000000000   no
    ```

    NOTE: `virbr_test` is listed, but not associated with any physical network interface

    d. Add a network interface to the bridge using `root # brctl addif eth1` command.

    NOTE: Network interface must not be already in use. This is because you can only enslave a network interface that is not yet used by other network bridge.

    e. Optionally, enable STP using `root # brctl stp VIRBR_TEST on` command.

    For more information, see https://www.suse.com/documentation/sles-12/book_virt/data/libvirt_-networks_bridged.html.

    ```
    brctl showbridge name      bridge id                STP enabled
    interfacesbr0     8000.28b9d9e09f41   no      eth0
    vnet0
    ```

13. To start your virtual machine, install Mobaxterm (GUI or X server support). See https://mobax-term.mobatek.net/download-home-edition.html

14. Run KVM machine and run `virt-manager`on the command line.

15. This gives you the virtual manager access through which you, start, stop, or change the MX-ONE deployed KVM and install it.

16. Executables are stored in `/usr/libexe`.

Installing MX-ONE KVM on Redhat-Linux

To install Kernel-based Virtual Machine (KVM) on Redhat-Linux, follow these steps:

1. Install the Redhat-7.6 OS through a bootable pen-drive or any other external media.
2. Create a bridge interface; for example, `ifcfg-br0`.

    NOTE: For configuration details, see Network Bridge.
3. Copy the `MX-ONE .qcow2` image to the host machine to continue installation. See *Creating a VM by Importing an MX-ONE qcow2 Image* for installation instructions.

Creating a VM by Importing an MX-ONE qcow2 Image

To create a virtual machine (VM) by importing an `MX-ONE qcow2` image, follow these steps:

1. Log in to your machine as root user.
2. Navigate to the directory of the installation files previously downloaded.

    NOTE: Create a backup copy of the image file.
3. Move the image file to the directory where you want to place the virtual machine.

4. Start the Virtual Manager and click **Create a new virtual machine**

5. Select **Import existing disk image** and click **Forward**. See *Create a new virtual machine screen* for details.
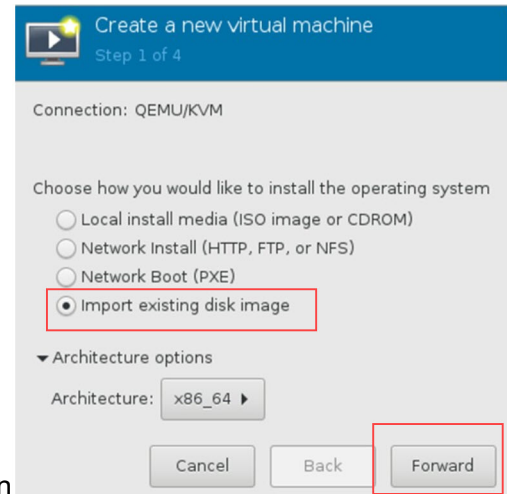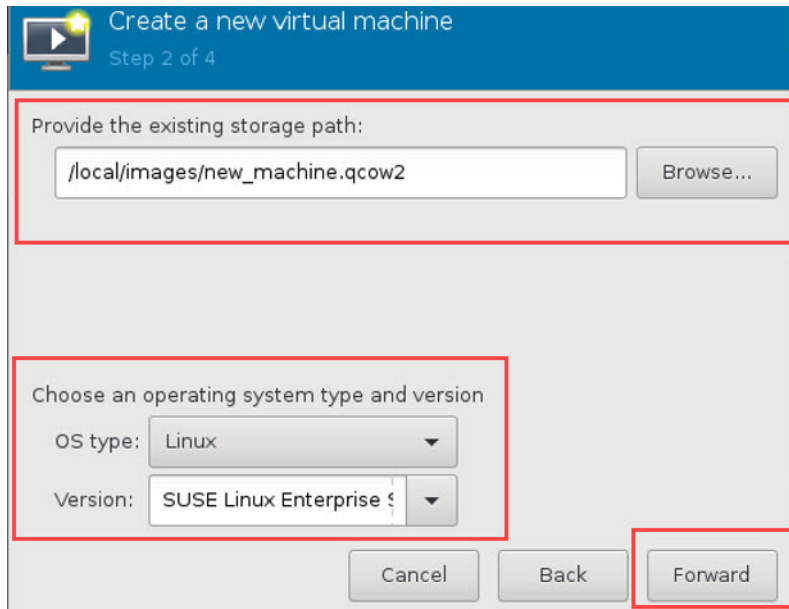

Figure 2.1: Create a new virtual machine screen

6. Click **Browse** and navigate to the path of the image file.

7. Select the image file and select the operating system type and version from the following fields and click **Forward**. See *Selecting the OS and version* for details.

    – **OS type**
    – **Version**

Selecting the OS and version

8. Complete the following fields and click **Forward** (see *Memory and CPU settings* for details):

   – **Memory (RAM)**
   – **CPUs**

   NOTE: For the memory and CPU settings, specify values that match your system. For the purposes of this procedure, the values 6 GB RAM (6144 MB) and 2 CPUs are specified.
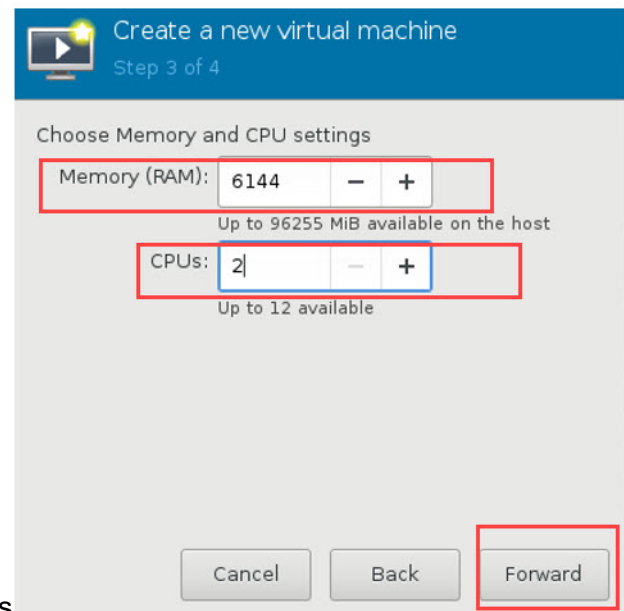

Figure 2.2: Memory and CPU settings

9. Click **Finish**. See *Creating a VM* for details.

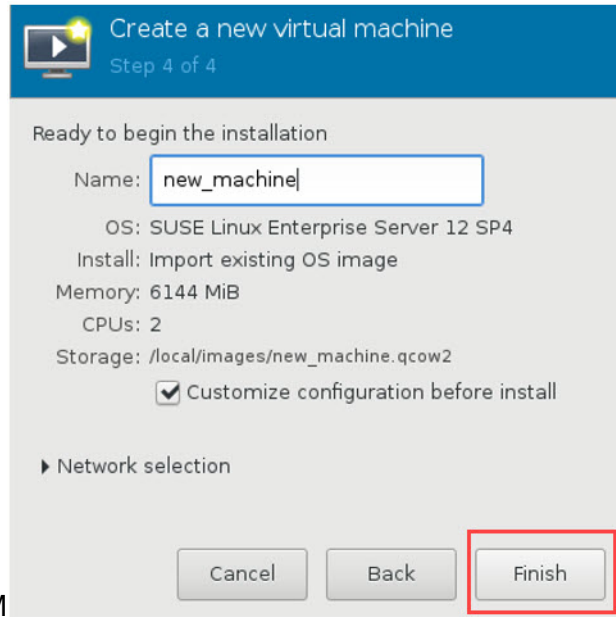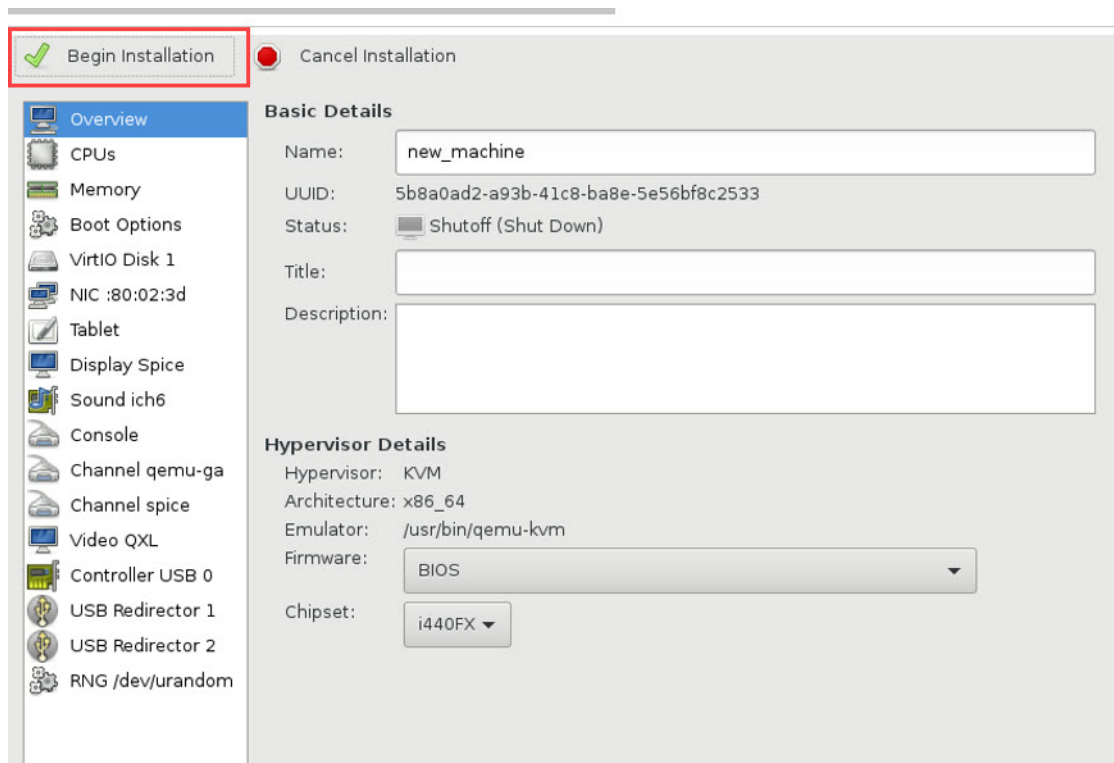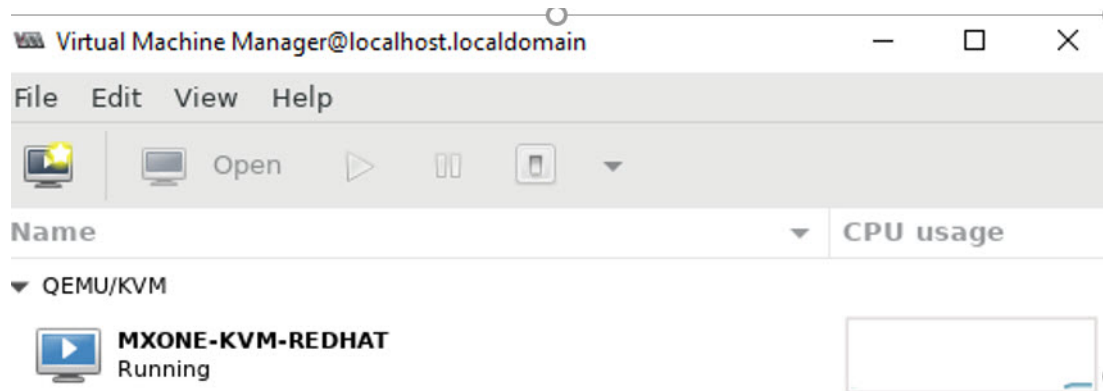   The details of the VM to be created are displayed.

Figure 2.3: Creating a VM

10. Click **Begin Installation**. The virtual machine is created. See *Begin Installation* for details.

Figure 2.4: Begin
Installation

11. Use the Mobaxterm (GUI or X server support). to open a virtual manager session. See *Virtual Machine Manager* for details.

Figure 2.5: Virtual Machine
Manager

Installing and Configuring MX-ONE

With all the virtual MX-ONE servers in place and configured, it is time to build a PBX out of them. The procedure of setting up the system is the same as for physical MX-ONE servers loaded with turnkey installations. The difference lays in the access of the MX-ONE servers that is done through the vSphere client.

For more details see *INSTALLING AND CONFIGURING MIVOICE MX-ONE.*

Installation - Turnkey Solution

The hardware installation of MiVoice MX-ONE is discussed in this topic. Follow the below mentioned sequence:

1. *Installation preparation and Earthing*
2. *Installing Chassis in a Cabinet*
3. *Installing Boards and Cabling*
4. *Installaing and Configuring MiVoice MX-ONE*

Introduction

MX-ONE is a communication solution for enterprises. MX-ONE integrates voice communication in fixed and mobile networks for public as well as private service. MX-ONE can be integrated into an existing Local Area Network (LAN) infrastructure. MX-ONE supports both IP telephony and functions found in classic circuit-switched PBXes (Private Branch Exchanges).

Scope

This document describes the MX-ONE installation procedure structure and shows the steps needed for a HW installation. For details of each area, see the following documents:

- *Installation preparation and Earthing*, 19/1531-ASP11301
- *Installation chassis in a Cabinet*, 20/1531-ASP11301
- *Installation boards and Cabling*, 21/1531-ASP11301

Target Group

The target group for this document is personnel involved in installing the MX-ONE.

Prerequisites

This section lists requirements that must be fulfilled before the installation starts.

Training

Personnel working with Mitel MX-ONE systems must have the training required to perform their tasks correctly.

It is recommended for engineers installing the MX-ONE to be acquainted with the following areas:

- MX-ONE Service Node
- Media Gateway in MX-ONE
- Certification
- TCP/IP Networks

Electrical Connections

Installation procedures involving connection of power cables, batteries and earthing, must be performed according to local regulations.

Safety

All personnel involved in installation must read and understand the safety instructions prior to installation, see the description document for *SAFETY*.

Site Planning

Read through each device installation documentation, and from there, conclude where the equipment shall be installed.

Special conditions are valid for the Nordic countries; Sweden, Norway and Finland, where the MiVoice MX-ONE must be installed in a Restricted Access Location (RAL).

For MX-ONE, an analogue trunk line generates a touch or leakage current which if there are several analogue trunk lines installed, it calls for the installation to be in a *"Restricted Access Location"*. The MX-ONE 3U and 7U chassis are marked with a warning text *"High voltage current..."* to reflect this.

Grounding and Earthing

In this document the expressions grounding and earthing have the same meaning.

Overview MiVoice MX-ONE Products

Boards in MiVoice MX-ONE

The following circuit boards can be used in the exchange. For technical data about the boards, see document 20/1531-ASP11301, *INSTALLATION CHASSIS and CABINET*.

Table 3.1: Boards (Sheet 1 of 2)

Board	Product number	Information
ALU2	ROF 137 5373/11	Alarm unit for external alarms
ASU Lite	ROF 137 6307/31	Mitel Server Unit, Lite. 8 GB
ASU-II	ROF 137 6307/4	Mitel Server Unit. 16 GB
ASU-III	---	---
DC/DC	ROF 137 6303/1	Power unit for 7U chassis
ELU26	ROF 137 5321/12	ISDN-S digital extensions
ELU31	ROF 137 5412/4	DECT extensions, Base stations
ELU33	ROF 137 5062/1	Digital extensions

Table 3.1: Boards (Continued) (Sheet 2 of 2)

Board	Product number	Information
ELU34	ROF 137 5064/x	Analog extensions with message waiting
FTU2	ROF 137 5415/11	Failure Transfer Unit
MFU	ROF 137 5348/x	Multi frequency unit
MGU2	ROF 137 6304/4	Media Gateway Unit, 4 E1/T1
TLU76	ROF 137 5338/x	Digital trunk, ISDN, E1, DPNSS, CAS, SS7
TLU77	ROF 137 5387/x	ISDN, T1, DPNSS, CAS depending on version
TLU79	ROF 137 5349/11	ISDN-T 2B+D trunk line
TLU80	ROF 137 5406/11	4-wire analog trunk using E&M signaling. **NOTE:** This board is used in MX-ONE Classic (7U), MX-ONE Lite (3U) and MX-ONE Slim (1U).
TLU83	ROF 137 6305/1	Analog trunk line (loop start, ground start, call metering. CLI with FSK and DTMF)
TMU	ROF 137 5335/x	Tone and Multi part Unit. DTMF

NOTE: When ASU is stated, it means both versions of ASUs are applicable, that is, ASU Lite, ASU-II, and ASU-III.

Mitel MX-ONE Chassis

MX-ONE 1U chassis, Prod No. 87L00032BAA-A

The MX-ONE 1U (prod. No. 87L00032BAA-A) is a 1U high chassis with space for 1pcs of 40mm board or 2 pcs of 20mm boards mounted horizontally. It has 3 cooling fans (on the left hand side).

Figure 3.1: The MX-ONE 1U chassis equipped with MGU2 and
ELU34

The 1U chassis can be fed with both -48VDC and 115/230VAC. All inlets are on rear side.

The 1U chassis can have input voltage in the range - 42VDC to - 56VDC.

The mounting brackets can be rotated to support either metric or 19-inch rack systems.

NOTE: There is no -5V provided in the backplane which means that e.g. TLU80 can be used in MX-ONE 1U chassis.

NOTE: The maximum power supply is 125 W. For power calculations see document *POWER CONSUMPTION*.

MX-ONE Lite, 3U chassis, Prod No. 87L00039BAA-A

This MX-ONE Lite is a chassis with boards mounted horizontally, and 2pcs of cooling fans (on the left hand side). The chassis can be equipped with up to 6pcs of 20mm boards.

MX-ONE Lite has board positions/Time slots 00, MGU/10, 20, 30, 40 and 50 counted from lowest position.

See MX-ONE Lite, 87L00039BAA-A, equipped with MGU2, ASU and 3 additional boards.

The chassis have the Fans in a unit that is easily switched if needed.

NOTE:

• Slot MGU/10 can only be used for MGU boards.
• The unit has replaceable fuses on the -48 V power supply voltages One (1) on the -48 V input and one (1) from the internal AC/DC power supply.
• There is no -5V provided in the backplane which means that e.g. TLU80 can be used in MX-ONE Lite.

If a 40mm building height server board (ASU) is installed, together with MGU2 with its 20mm front, three slots are left for an arbitrary MX-ONE board, for example an ELU33, ELU34 and TMU/12. See Figure 2:MX-ONE Lite, 87L00039BAA-A, equipped with MGU2, ASU and 3 additional boards.

The 3U chassis can have input voltage in the range - 46VDC to - 56VDC.

NOTE: The maximum power supply is 250 W. For power calculations see document *POWER CONSUMPTION*.

Figure 3.2: MX-ONE Lite, 87L00039BAA-A, equipped with MGU2, ASU and 3 additional boards


MX-ONE Classic, 7U chassis

In the MX-ONE Classic (prod. No. BFD76140/x) the boards are mounted vertically in this 19 inch wide chassis. This chassis need additional Fan Unit. See *Fan Unit (for 7U chassis) on page 8* . The chassis can only be feed by -48V in the front of the DC/DC-board.

The MGU board goes in the middle at a dedicated position. It is recommended to place the ASU on the right side of the MGU.

The MX-ONE Classic has time slots marked on the top label. The marking is 00, 10,..., 70 starting from board position 01 and from board position 45. These positions are intended for the device boards.

**Figure 3.3:** MGU2 and ASU in the 7U high,19 inch chassis
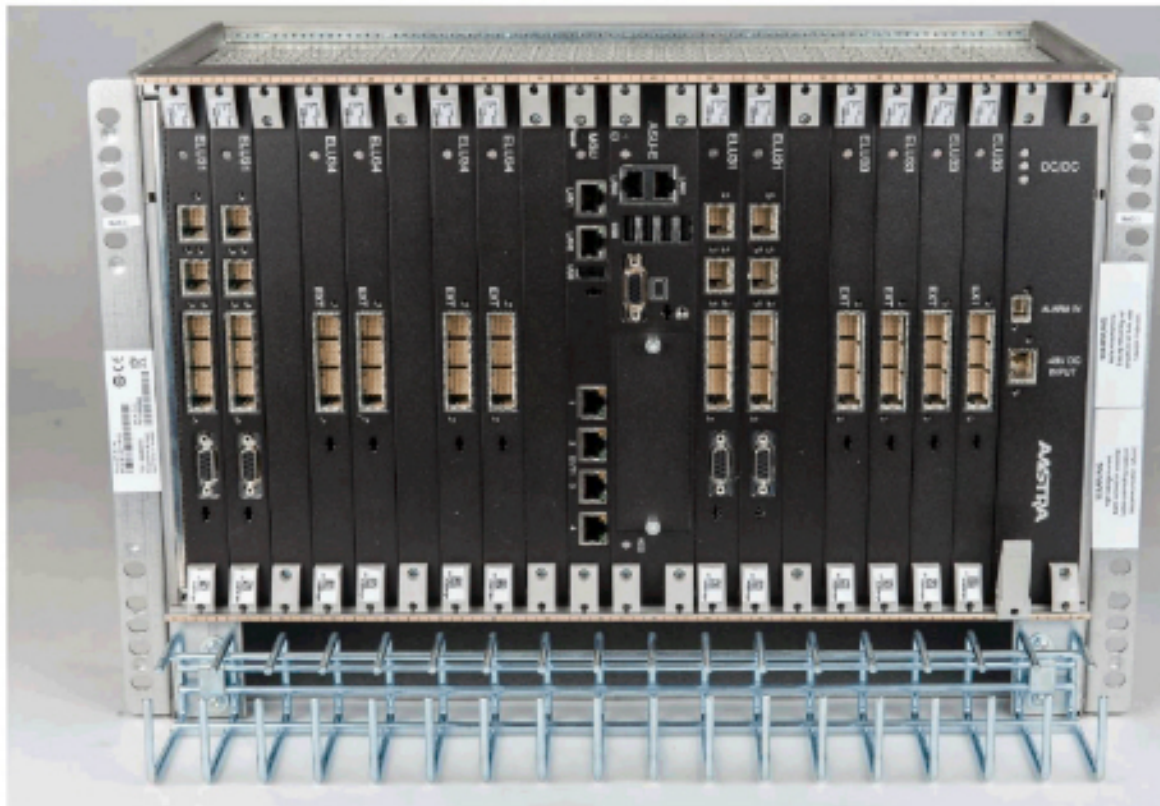
NOTE: To fulfill the demands on Fire Enclosure for the 7U chassis, the Air plate SXA1122330/1 included in NTM144262 have to be mounted. See document 20/1531-ASP11301, *Installing Chassis in a Cabinet*.

Fan Unit (for 7U Chassis)

The fan unit provides forced cooling of the MX-ONE Classic media gateway boards in the 7U chassis. One fan can be used to serve two 7U- chassis on top of each others.

Figure 3.4: Fan
Unit
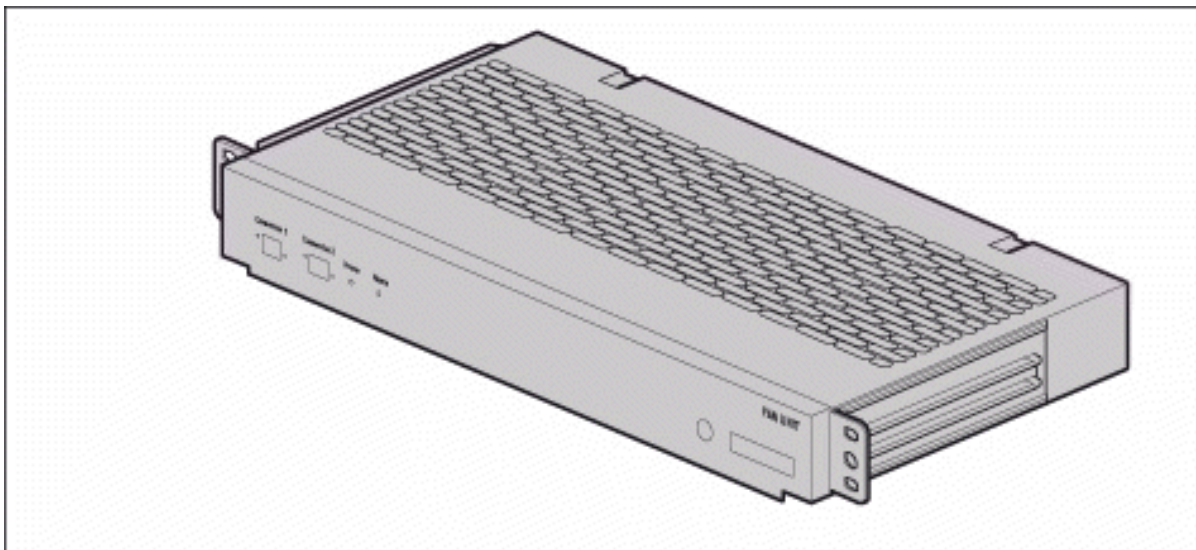
Servers

There are several types of servers used in the MX-ONE. The ASU Servers in two versions and the Standard Servers.

For technical data about the servers, see document *INSTALLATION CHASSIS IN A RACK*.

Figure 3.5: ASU in a MX-ONE 1U
chassis

The ASU Server consists of an Server board (ASU) slided into the MX-ONE 1U chassis.

AC/DC Power Units

The AC/DC power units converts the power from the AC power supply network (mains) to DC output for the batteries and for the 1U, 3U and 7U chassis.

For installation of these Power Units it is important to follow the suppliers Installation Instructions/Manuals.

51305282, 2U Power Unit

The Aspiro 2U height Power Unit is delivered with one 800W rectifier module with a spare slot for one extra rectifier to support a total of 1600W. Optional Controller (PCC) and cables for battery, battery supervision and Alarm handling are available.

NOTE: The PCC is needed to control batteries.

Figure 3.6: 2U height AC/DC Power Unit, 800-1600W

NOTE: The AC/DC above is equipped with 2x800W rectifier and the PCC-unit.

ABB (GE) 48V Power Unit (SPS - 48V Slimline Power Shelf)

A new 48 Volt power supply unit introduced as an alternative to the present UniPower (2U) system. The new unit is from ABB (former GE) and is called SPS-48V Slimline Power Rack. This comes with SNMP support.

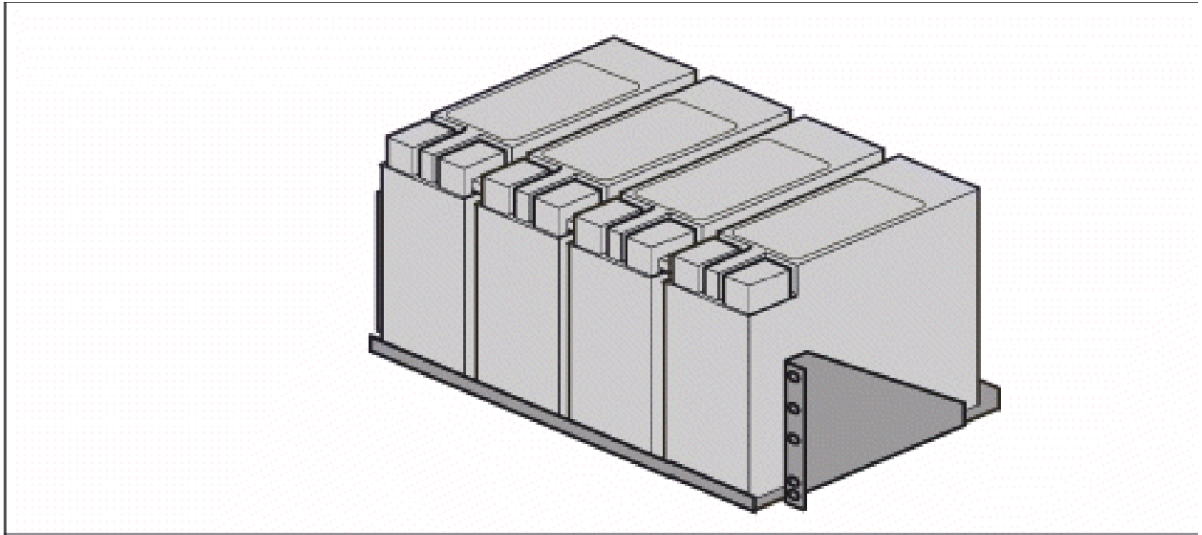**Figure 3.7:** 2U height AC/DC Power Unit,

800-1600W

Battery String

The batteries provide backup power to the system. Two types of batteries are available, 31 Ah and 62 Ah.

Figure 3.8: Batteries (62 Ah) and Battery
Shelf

For technical data about the batteries, see document *INSTALLATION CHASSIS IN A RACK* .

Cables

Cables for each board, power and batteries see document 21/1531-ASP11301*INSTALLATION BOARDS AND CABLING*.

Environmental Requirements

Read through each device installation documentation, and from there, conclude that all of the equipment can be installed.

NOTE: Values below are relevant for MX-ONE products. For other products see suppliers Technical Specification.

The exchange room must meet the following requirements:

- The air shall not contain any dust, smoke, gases or acid fumes

- Temperature +5 to +40 ^{o}C (+41 to +104 ^{o} F)

- Relative air humidity 20-80%

- The relationship between temperature and air humidity shall not cause condensation

- The equipment must not be exposed to direct sunlight

- Ensure that the floor withstands the mass of the PBX

- For concrete floor, the distributed load is the total mass of equipment in the room divided by the area of the room

- For wooden floor, extra caution must be taken concerning the spot load of the cabinets

- The floor should be covered by an earthed anti-static carpet in order to reduce the risk of the exchange being exposed to interference caused by static electricity

If the batteries are to be installed in the exchange room, they must be of a type which does not produce gases or acid fumes.

If the batteries are to be installed in a room outside the exchange room, the environmental conditions must comply with the battery suppliers instructions.

The PBX operators room should be of standard office design, but the floor as in the exchange room should be covered by an anti-static carpet.

Installation Preparation

The site is prepared mostly during the site planning stage, as described in the environmental spec for *MX-ONE SITE PLANNING*. Should these preparations not be complete, perform the following steps before starting the installation:

1. Mark where to position the equipment and where to mount wall supports (if required).

2. Drill holes for anchoring the rack to the floor (use the rack and the tip protection as a template).

3. If necessary, make holes for the running of cables between rooms.

4. If required, set up cable chutes in the site.

5. Clean the room before unpacking the equipment.

6. Check that needed tools are available. For more details, see installation instructions for *Installation preparation and Earthing*.

7. Check that ESD-straps are available. For more details, see installation instructions for *Installation preparation and Earthing*.

Unpacking

Check that you have received all part and products according to the delivery slip.

Be careful when open the packing, so no parts are damaged by sharp tools.

Secure that no parts remains in the packing

Recycle the packing material according to local recommendations.

For more details about Installation Preparation, see installation instructions for *Installation preparation and Earthing*.

Earthing

It is vital that all MX-ONE hardware building blocks are properly connected to a common earth.

Ensure that the different units, the MX-ONE Service Node, the Standard Server, the MX-ONE Lite, the MX-ONE Classic, the AC/DC unit and the fan unit, are connected to the common earth when these units are screwed into a 19" rack.

Also ensure that MX-ONE equipment that is located outside of the racks, like, for example, voice recording equipment, are properly connected to the common earth.

At both ends of the grounding conductor the units shall be free from paint or other insulating material.

NOTE: he earth resistance shall not exceed 10 milli ohms.

For more details about Earthing, see installation instructions for *INSTALLATION PREPARATION AND EARTHING*.

Installing Chassis in a Cabinet

These chapters describes the installation of hardware components in the BYB 501 cabinet. The recommended installation order is from the bottom of the cabinet to the top.

For details see doc 20/1531-ASP11301 *Installing Chassis in a Cabinet*

Depending on the configuration, some pieces of hardware can be pre-installed. There-fore, some installation steps may be irrelevant. In that case, ignore the irrelevant step and proceed to the next one.

It is recommended to install the hardware at the cabinet locations described in the instructions. Although not recommended, it is possible to change the hardware place-ment in the cabinet. In that case, the following constraints must be regarded:

- The batteries must be placed at the lowest position in the cabinet.
- The fan unit must always be installed directly above the 7U sub-racks.
- If two 7U sub-racks are mounted, they must be mounted closely, one above the other, and with a fan unit on top.

NOTE: The instructions describe a hardware installation in the BYB 501 cabinet. When installing the hardware in other type of cabinets, refer to manufacturer instructions.

Overview

The following flow diagram shows the installation procedure step-by-step.

Figure 3.9: Work-flow for the MX-ONE
Installation
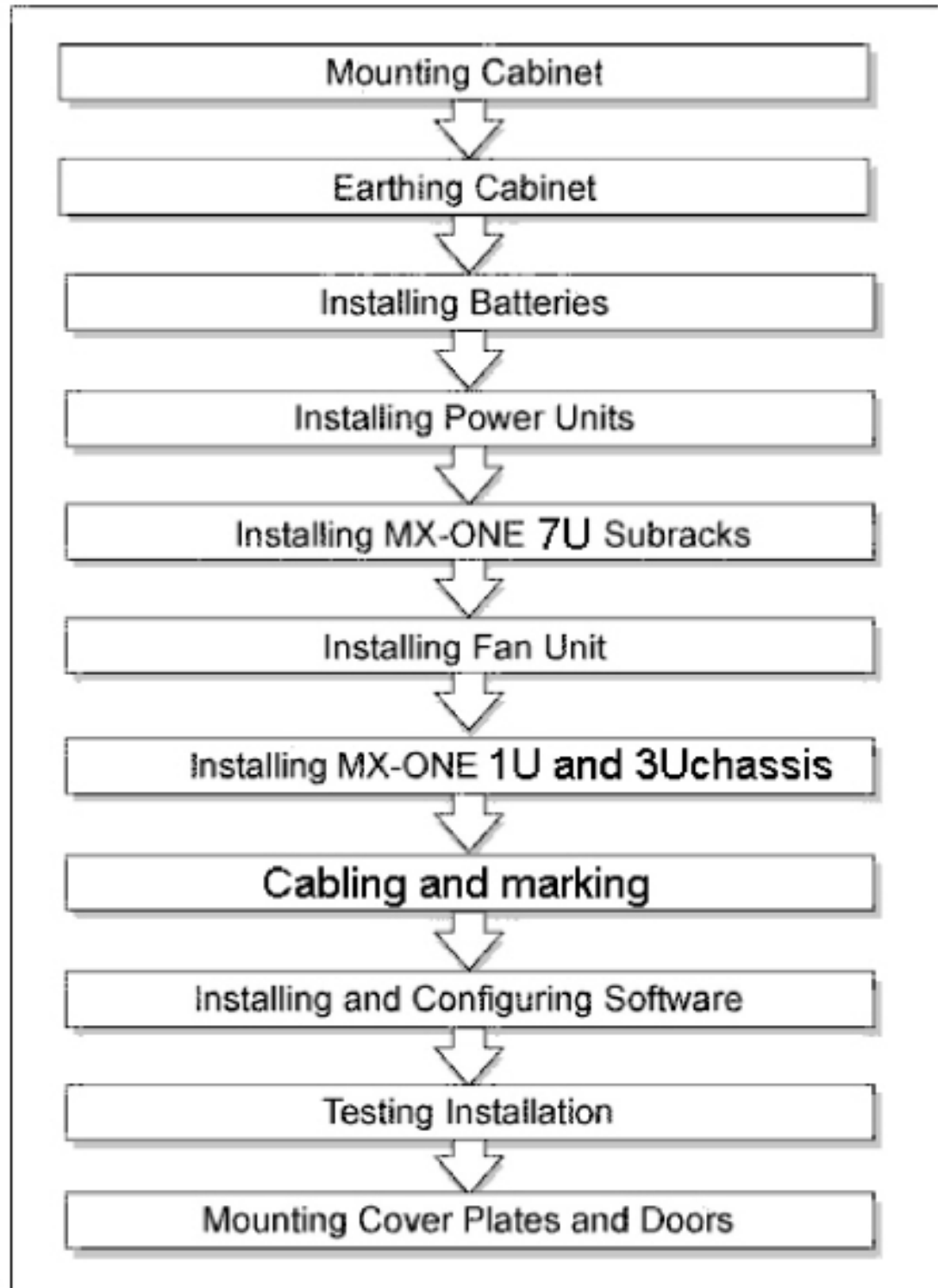
```
┌─────────────────────────────────────────────┐
│              Mounting Cabinet                 │
└─────────────────────────────────────────────┘
                     ⇩
┌─────────────────────────────────────────────┐
│              Earthing Cabinet                 │
└─────────────────────────────────────────────┘
                     ⇩
┌─────────────────────────────────────────────┐
│             Installing Batteries              │
└─────────────────────────────────────────────┘
                     ⇩
┌─────────────────────────────────────────────┐
│            Installing Power Units             │
└─────────────────────────────────────────────┘
                     ⇩
┌─────────────────────────────────────────────┐
│        Installing MX-ONE 7U Subracks          │
└─────────────────────────────────────────────┘
                     ⇩
┌─────────────────────────────────────────────┐
│             Installing Fan Unit               │
└─────────────────────────────────────────────┘
                     ⇩
┌─────────────────────────────────────────────┐
│     Installing MX-ONE 1U and 3Uchassis        │
└─────────────────────────────────────────────┘
                     ⇩
┌─────────────────────────────────────────────┐
│             Cabling and marking               │
└─────────────────────────────────────────────┘
                     ⇩
┌─────────────────────────────────────────────┐
│       Installing and Configuring Software     │
└─────────────────────────────────────────────┘
                     ⇩
┌─────────────────────────────────────────────┐
│             Testing Installation              │
└─────────────────────────────────────────────┘
                     ⇩
┌─────────────────────────────────────────────┐
│        Mounting Cover Plates and Doors        │
└─────────────────────────────────────────────┘
```

Cabling

Cabling involves both internal and external connections on site.

External cabling is the routing of cables for grounding, to power equipment and other external devices.

Internal cabling is the routing of cables within a cabinet or between cabinets.

For details about cables, cable connection and marking see document 21/1531-ASP11301, *INSTALLATION BOARDS AND CABLING* , chapter 3.

Use the fastener straps (cable tie) provided in material set 25/BYB 501/1 to fasten the cables to the rack, cable chutes, rear sides of chassis and so on.

Connection of External Cables

Cabling to the MDF uses prefabricated cables.

Twisted, shielded, pair-cables are to be used for cabling between the PBX and MDF or between two PBXes (Media Gateway - Media Gateway).

For information about cables see document 21/1531-ASP11301, *INSTALLATION BOARDS AND CABLING*.

Alarm Installation

General alarms can be monitored in several ways depending on how the system is configured. In systems with MX-ONE Classic (7U chassis) and MGU board, the simplest way is to use the alarm input on the DC/DC-board and configure the MGU board.

When many external alarm shall be monitored or when system is not equipped with MGU board, an ALU2 board can be used.

If more in- or out- signals are required, the number of ALU2 boards can be increased. Alarm indications are normally transferred to the PBX operator consoles when using ALU2.

In systems with MGU boards, the system can supervise several alarms, both external and internal.

For details about alarm and the installation, see document *INSTALLATION BOARDS AND CABLING*.

Software Installation and Configuration

For software installation and configuration of MX-ONE, see the installation instructions for *INSTALLING AND CONFIGURING MIVOICE MX-ONE*.

For software installation and configuration of MX-ONE Messaging, see the installation instructions for *Fax Mail* and *Voice Mail*.

Installation Test

This section describes installation test at the end of the installation procedure.

Basic Installation Test

This section specifies basic check for correct installation of hardware components, mechanics, and cables.

1. Ensure that all internal, external, power and network cables are correctly connected.
2. Ensure that all cable connector screws are firmly tightened.

Installation Test for MiVoice MX-ONE

To check functionality for the MX-ONE telephones (if available) proceed as follows:

1. Make calls from an IP telephone to another IP telephone, to an analog telephone, to a cordless DECT phone, to a digital telephone and to a external number.
2. Make calls from an IP telephone to another IP telephone, to an analog telephone, to a cordless DECT phone, to a digital telephone and to a external number.

3. Make calls from a Digital telephone to another Digital telephone, to an analog telephone, to a DECT phone, to a IP telephone and to a external number.

4. Make a call from an external number to a Digital telephone.

5. Make calls from an analog telephone to another analog telephone, to a IP telephone, to a DECT phone, to a digital telephone and to a external number.

6. Make a call from an external number to a analog telephone.

7. Make calls from a DECT telephone to another DECT telephone, to an analog telephone, to a IP phone, to a digital telephone and to a external number.

8. Make a call from an external number to a DECT telephone.

9. Make calls to and from an Operators terminal to above different terminals (if available) and to and from an external number.

Concluding Routines

Before leaving the installation site, complete the following steps:

1. Clean up the site and remove objects like wrapping paper and cable pieces.
2. Dispose of waste material according to local regulations.

3. Print one copy of the safety document, and place it visible on site, see the description for *SAFETY*.

4. Place the battery service instruction sheet (included in NTM 144 265 see Mounting set for Battery) visible on site.

5. Ensure that the warning label (SVB 131 75) is fastened visible and close to the AC/DC unit.

6. Ensure that all cables to and from the chassis have earth connections mounted and that no cable shields are damaged.

7. Ensure that no internal cables are going outside the containment.

Installation Preparation and Earthing

Introduction

MX-ONE is a communication solution for enterprises. MX-ONE integrates voice communication in fixed and mobile networks for public as well as private service. MX-ONE can be integrated into an existing Local Area Network (LAN) infrastructure. MX-ONE supports both IP telephony and functions found in classic circuit-switched PBXes (Private Branch Exchanges).

Scope

This document describes the MX-ONE installation preparation and Earthing in a detailed way. It is aimed for customers doing new installation. For other parts of the Installation see:
- Installation chassis in a Cabinet, 20/1531-ASP11301
- Installation boards and Cabling, 21/1531-ASP11301

Target Group

The target group for this document is personnel involved in installing the MX-ONE.

Prerequisites

This section lists requirements that must be fulfilled before the installation starts.

Electrical Connections

Installation procedures involving connection of power cables, batteries and earthing must be performed according to local regulations.

Safety

All personnel involved in installation must read and understand the safety instructions prior to installation, see the description document for *SAFETY*.

Installation Preparation

The site is prepared mostly during the site planning stage, as described in the environmental spec for MX-ONE SITE PLANNING. Should these preparations not be complete, perform the following steps before starting the installation:

1. Mark where to position the equipment and where to mount wall supports (if required).

2. Drill holes for anchoring the rack to the floor (use the rack and the tip protection as a template).

3. If necessary, make holes for the running of cables between rooms.

4. If required, set up cable chutes in the site.

5. Clean the room before unpacking the equipment.

Tools

The following tools are required for hardware installation in a BYB 501 cabinet:

Table 3.2: Tools

Tool	Product Number	Dimensions	Used for
Set of tools	LTT 999 08/1		
U-Ring wrench	LSB 116 24	W = 24 mm	Tip protection and cabinet feet
U-Ring wrench	LSB 116 13	W = 13 mm	Battery pole nuts
Torx T20 screwdriver	LSA 126 11/20		ESD-cover, air plates
Torx T8 screwdriver	LSA 126 11/8		Air plates, board fronts, and cable connectors
Extractor	LTD11702		Sliding out boards from chassis
ESD Wrist Strap	LYB 250 01/141	Included in BYB 501 Cabinet Frame	

Drilling machines, soldering irons and so on, must be of double-insulated type

ESD Wrist Strap in Conjunction with Service

It is recommended that the personnel uses Electrical Static Discharge (ESD) wrist straps connected to earth when carrying out installation and service. Two earth points are placed at the top of each BYB 501 cabinet see Figure :ESD-earth Points in BYB 501 on page 5. ESD wrist strap (LYB 250 01/141) is delivered with the BYB 501 cabinet.

For other cabinets use ESD wrist strap and connect to the a cable lug SNG 804 23 or similar point. see Figure :ESD-earth Point Cable Lug SNG 804 23 (G).

Figure 3.10: ESD-earth Points in BYB 501
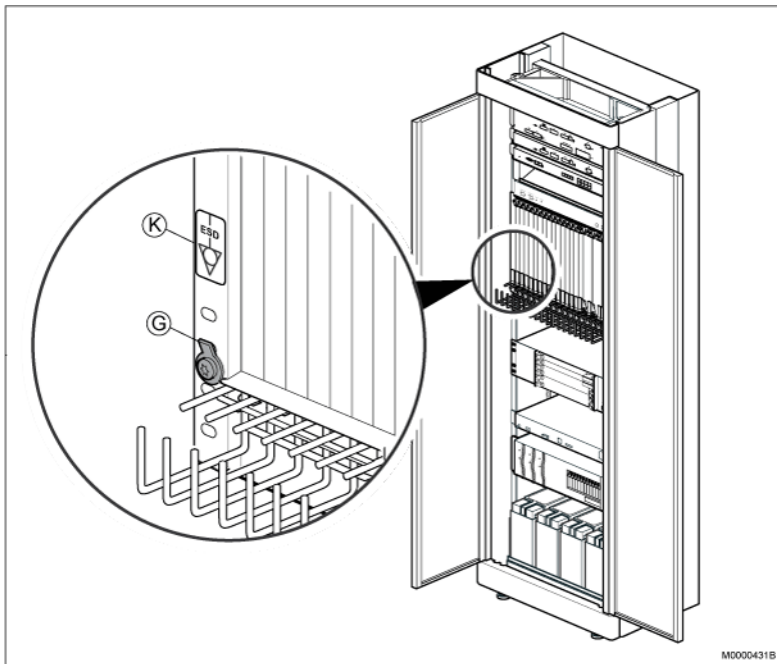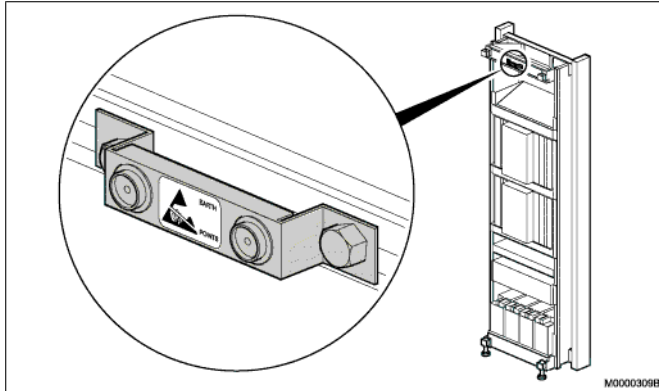
ESD-earth Point Cable Lug SNG 804 23 (G)

Delivery Documents

Verify that required documents are accessible:

• Delivery documents (shipping specification)
• CPI documentation library for the MX-ONE
• Server hardware documentation delivered from the server manufacturer

Unpacking

To keep a tidy work environment it is recommended to unpack one piece of hardware at a time. Start unpacking the equipment in the following order:

1. Inspect the cases for any external damage.
2. Open the cases and the protecting plastic wrapping, and remove all packing material.

3. Check that the equipment has not been damaged during transport. If equipment has been damaged and must be replaced or repaired at the service shop, report this immediately.

4. Make sure the required material sets are provided with the equipment.

5. Make sure no necessary parts are discarded together with the packing material.

6. Make sure the correct equipment has arrived by comparing the received items with the item list in the shipping specification.

7. Report any missing items to the sender.

Earthing

It is vital that all MX-ONE hardware building blocks are properly connected to a common earth.

Make sure that the different units, the MX-ONE Service Node, the Standard Server, the MX-ONE 1U chassis, the MX-ONE Lite, the MX-ONE Classic, the AC/DC unit and the fan unit, are connected to the common earth when these units are screwed into a 19" rack.

Also make sure that MX-ONE equipment that is located outside of the racks, like, for example, voice recording equipment, are properly connected to the common earth.

At both ends of the grounding conductor the units shall be free from paint or other insulating material.

NOTE: The earth resistance shall not exceed 10 milli ohms.

Earthing the Cabinets

MX-ONE must be multi-point grounded.

Use the following material sets to ground the BYB 501 cabinets:

Table 3.3: Grounding Material, Basic

NTM 503 46/122 Earthing Material, Basic			
Pos.	**Title/Function**	**Product Number**	**Quantity**
A	Earth bar	SNV 103 04	1
B	Earth clip	105 4546/1	5
C	CABLE 50 mm ^{2}, isolated	TFL 104 510/08	25 M

Table 3 Earthing Material, Extra

NTM 503 46/123 Earthing Material, Extra			
Pos.	**Title/Function**	**Product Number**	**Quantity**
B	Earth clip	105 4546/1	5

NTM 503 46/123 Earthing Material, Extra			
Pos.	**Title/Function**	**Product Number**	**Quantity**
C	CABLE 50 mm ^{2}, isolated	TFL 104 510/08	25 M

Figure 3.11: Grounding

Overview
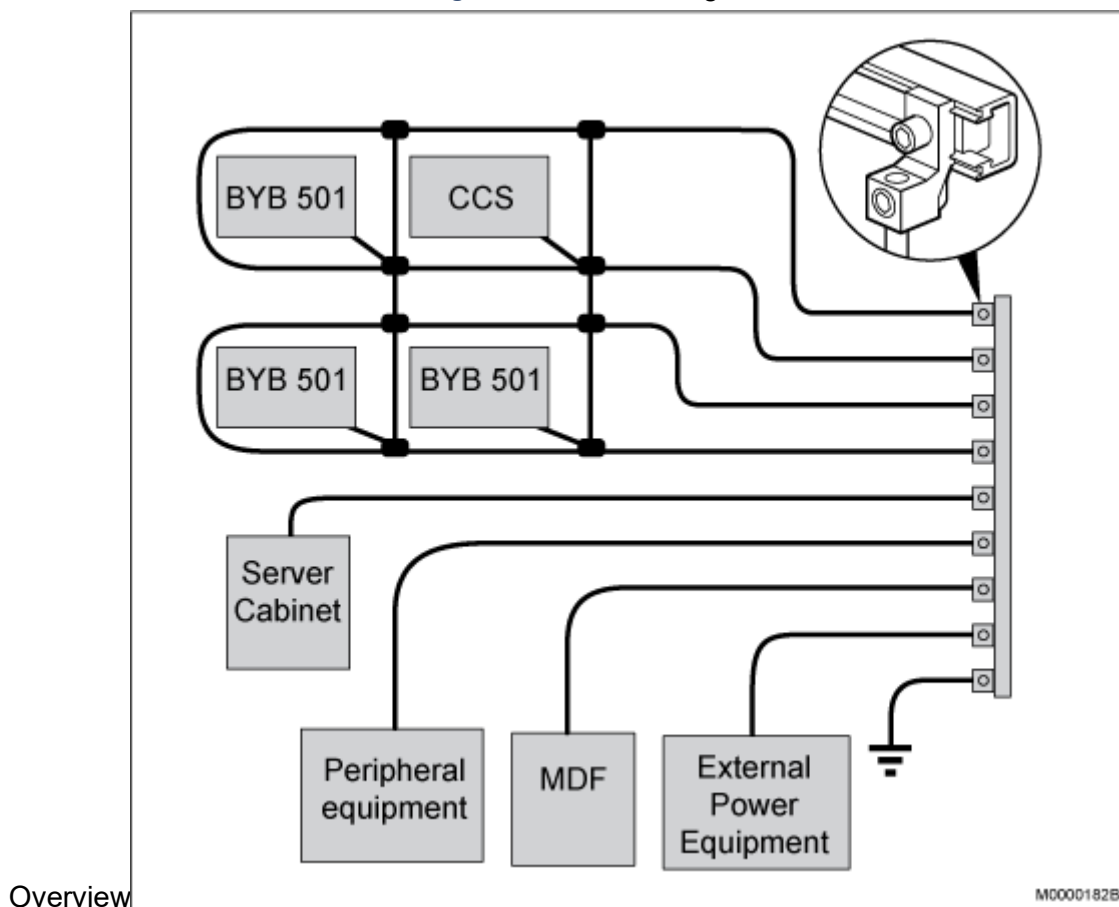
Table 3.4: Cabinet Earthing Set

16/BYB 501 Cabinet earthing set			
Pos.	**Title/Function**	**Product Number**	**Quantity**
A	EARTHING CABLE	SXK 118 0154/2	1
B	SCREW M 8X25	78/SBA 178 080/0250	2
C	CONTACT WASHER	SCL 100 165/84	2
D	CONNECTOR	NED 901 13/1	1

Figure 3.12: Grounding of BYB 501
Cabinet
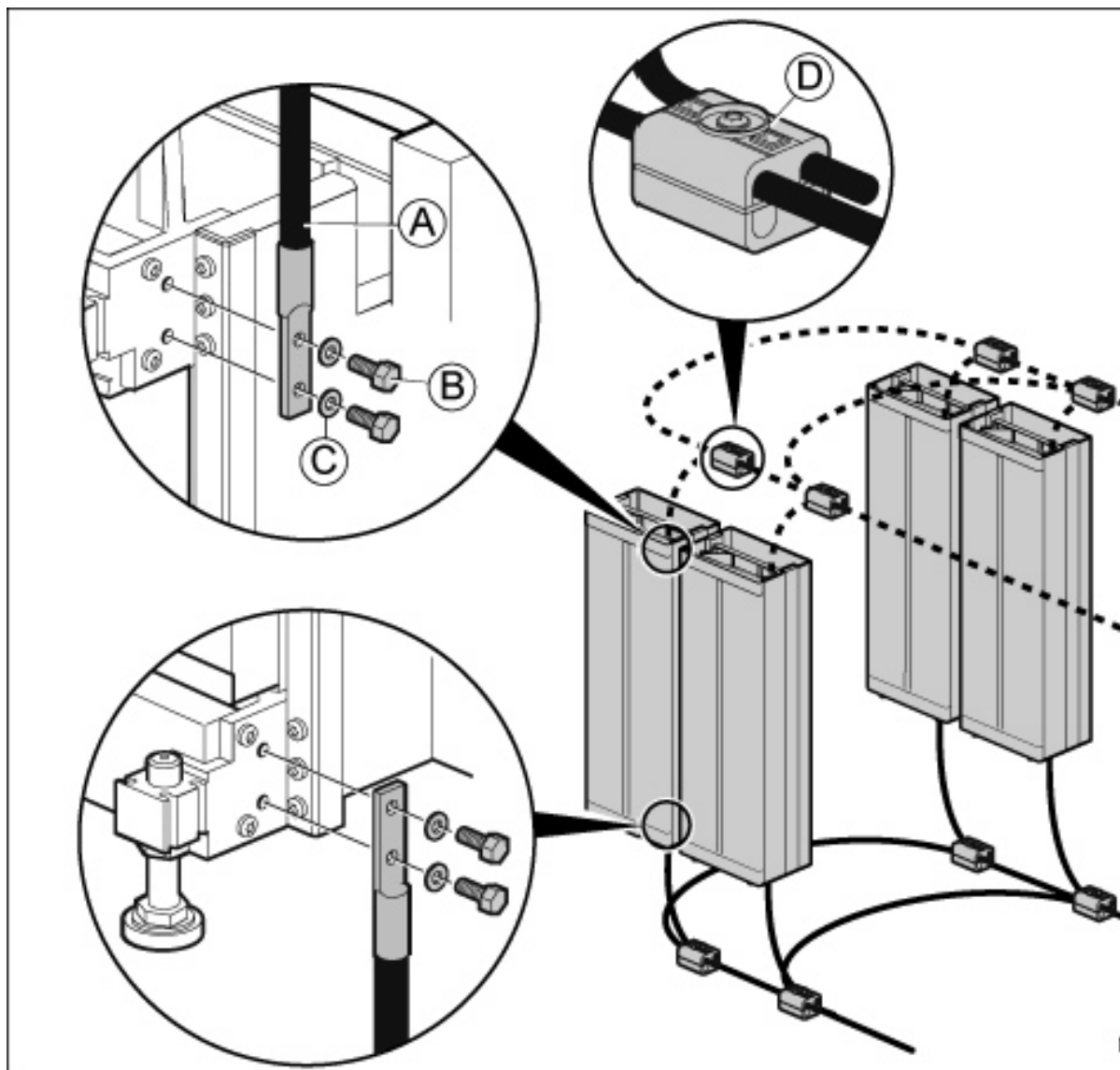
Continue the grounding procedure by connecting adjacent cabinets with an earthing bar.

Mounting Earthing Bar

Table 3.5: Material Set for Earthing Bar (Sheet 1 of 2)

15/BYB 501 Material set for earthing			
Pos.	**Title/Function**	**Product Number**	**Quantity**
B	EARTHING BAR	SXA 210 033/1	2

Table 3.5: Material Set for Earthing Bar (Continued) (Sheet 2 of 2)

15/BYB 501 Material set for earthing			
Pos.	**Title/Function**	**Product Number**	**Quantity**
A	BAR NUT (only for old cabinet)	SXA 123 0687/2	4
C	SCREW M8X16 (only for old cabinet)	03/SBA 178 080/0160	8
C	SCREW M8X25	78/SBA 178 080/0250	8
	CONTACT WASHER (to be placed between earthing bar and cabinet)	SCL 100 165/84	8

To mount the set of 15/BYB 501 in a side-by-side cabinet setup, perform the following steps:

Figure 3.13: Mounting the Earth Bar
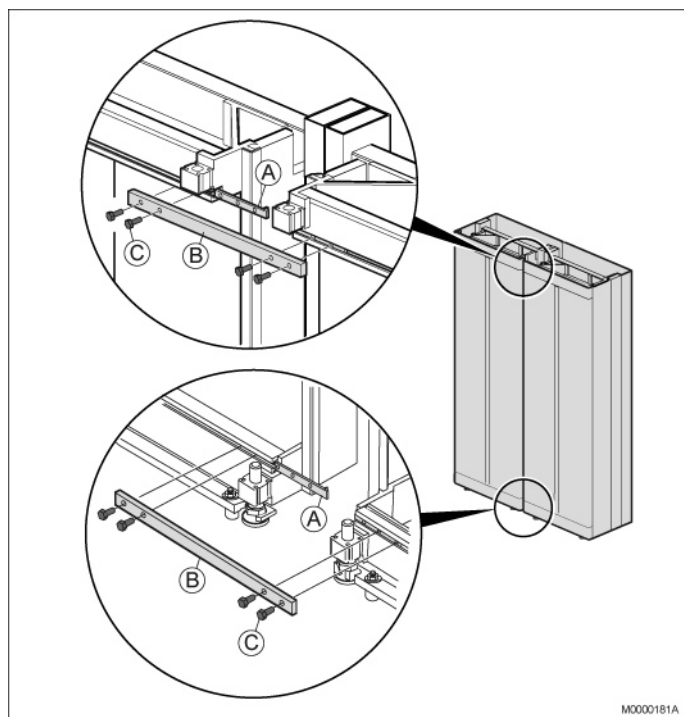
1. Install the earthing bars (B) with screws (C) and, a washer between the earth bar and the cabinet, see Figure :Mounting the Earth Bar on page 10. (Bar nut (A) is not used in some cabinet) .
2. Install the earth bars between each cabinet at the top and bottom.
3. Verify that the torque of all mounting screws is set to 20 +/-1 Nm.

Installing Chassis in a Cabling

Introduction

MX-ONE is a communication solution for enterprises. MX-ONE integrates voice communication in fixed and mobile networks for public as well as private service. MX-ONE can be integrated into an existing Local Area Network (LAN) infrastructure. MX-ONE supports both IP telephony and functions found in classic circuit-switched PBXes (Private Branch Exchanges).

Installing Cabinet

This section describes a full installation of hardware components in the BYB 501 cabinet. The recommended installation order is from the bottom of the cabinet to the top.

Depending on the configuration, some pieces of hardware can be pre-installed. Therefore, some installation steps may be irrelevant. In that case, ignore the irrelevant step and proceed to the next one.

It is recommended to install the hardware at the cabinet locations described in the instructions below. Although not recommended, it is possible to change the hardware placement in the cabinet. In that case, the following constraints must be regarded:

- The batteries must be placed at the lowest position in the cabinet.
- The fan unit must always be installed directly above the subracks.
- Two subracks must be mounted closely, one above the other.

NOTE: The following instructions describe a hardware installation in the BYB 501 cabinet. When installing the hardware in other type of cabinets, refer to manufacturer instructions.

Overview

This section describes the hardware components in the MX-ONE, their functions, and technical details as dimensions and weights.

The hardware components in the MX-ONE are mounted in 19-inch cabinet: the BYB 501 cabinet, the standard cabinet (locally sourced).

This document describes installation of hardware in the BYB 501. Most of the instructions are also relevant for installation in other 19-inch cabinets.

The hardware components include a variable number of power units, batteries, subracks with extension boards, fan units, Media Gateways, and servers. The number of components and their location in the cabinet vary according to customer needs.

For an example of an MX-ONE cabinet and its main hardware components.

Table 3.6: MX-ONE Cabinets components (Sheet 1 of 2)

A	MX-ONE cabinet, BYB 501
B	Standard cabinet (locally sourced)
C	Battery string

Table 3.6: MX-ONE Cabinets components (Continued) (Sheet 2 of 2)

D	AC/DC unit
E	DC/AC inverter (locally sourced)
F	Subrack MX-ONE Lite
G	Subrack MX-ONE Classic
H	Fan unit
I	Servers for the MX-ONE and MX-ONE Messaging
K	MX-ONE Server

For information on technical details for the hardware components, see above table Size, Weight, and Voltage of MX-ONE Hardware.

Figure 3.14: MX-ONE
Cabinets
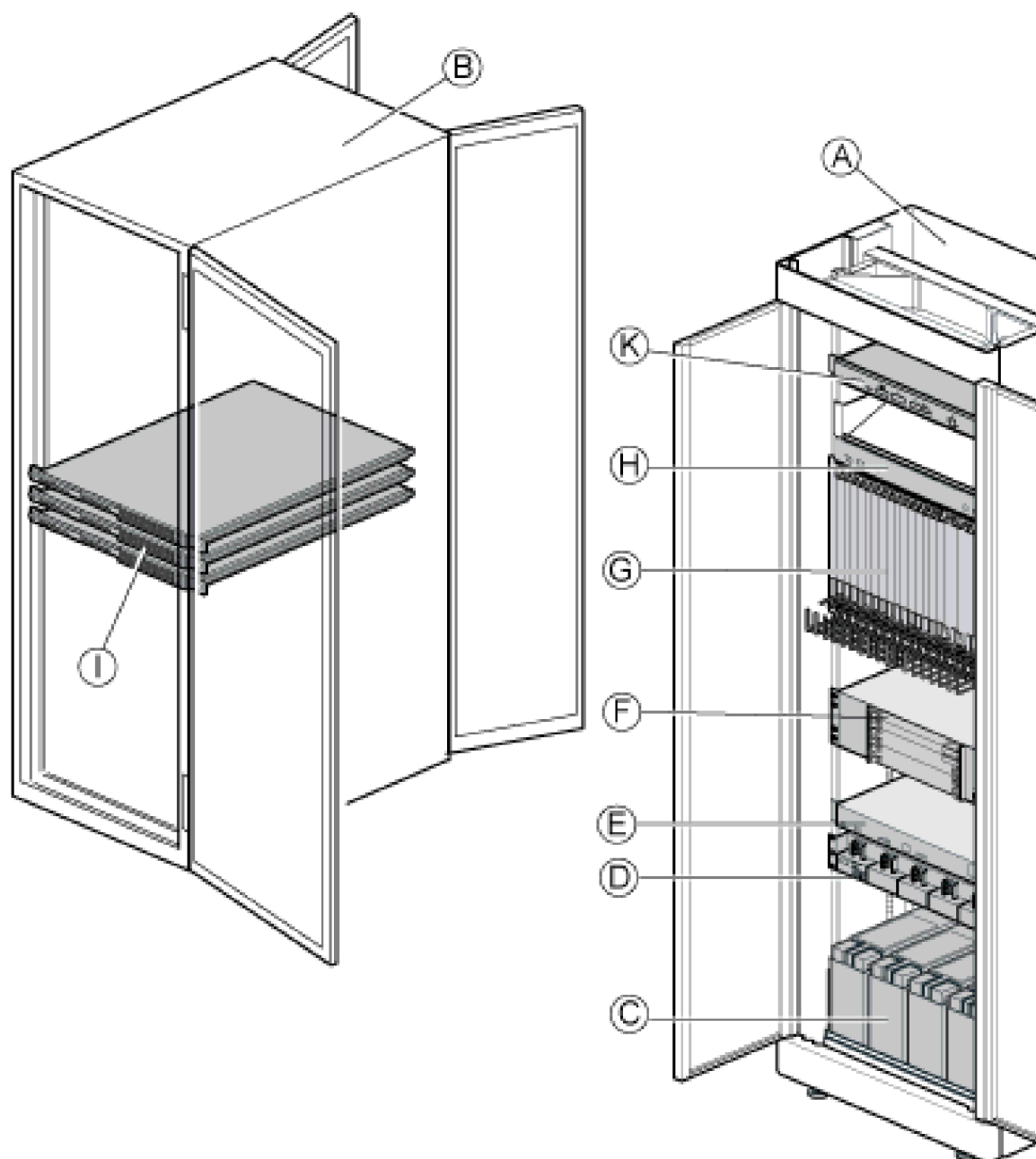
Table 3.7: Size, Weight, and Voltage of MX-ONE Hardware (Sheet 1 of 2)

Pos	Component	Product Number	Width, height, and depth (mm)	Weight (kg)	Input Voltage	Output voltage	Height (U)[2]	Height (M)[3]
A	BYB 501 cabinet		600 x 1,800 x 400	75				
B	Standard cabinet	Locally sourced						
C	Battery 31 Ah (4 battery blocks)	BKB 201 003/1	425 x 159 x 280	45		-48 V DC	4	7.2
	Battery 62 Ah (4 battery blocks)	BKB 201 003/2	425 x 264 x 280	82		-48 V DC	6	10.8
D	AC/DC Unit	5130 5282	440 x 90 x 350	12.8 - 14.6 [1]	90 - 250 V AC	-48 V DC	2	4
E	DC/AC Inverter	Locally sourced						
F	MX-ONE Lite (3U-chassis)	87L000 39 BAA-A	440 x 130 x 235					
G	Battery (4batteryblocks)							
H	MX-ONE SPS-48V Slimline Power Rack	160028 1567A	-	-	-	-	-	-
I	MX-ONE SPS-48V Rectifier module 1000W	CC1091 65502	-	-	-	-	-	-

Table 3.7: Size, Weight, and Voltage of MX-ONE Hardware (Continued) (Sheet 2 of 2)

Pos	Component	Product Number	Width, height, and depth (mm)	Weight (kg)	Input Voltage	Output voltage	Height (U)[2]	Height (M)[3]
J	MX-ONE SPS-48V Battery thermal probe	CC1091 42980	-	-	-	-	-	-
K	MX-ONE SPS-48V Battery thermal probe cable (10')	CC8488 17024	-	-	-	-	-	-
Spare Parts								
L	MX-ONE SPS-48V Controller (FRU)	150038 227	-	-	-	-	-	-
M	MX-ONE SPS-48V 10A breaker (FRU)	450023 461	-	-	-	-	-	-

Mounting Cabinets

This section describes mounting of the cabinets. The instructions focus on the BYB 501 cabinets. For installation of the standard server cabinet, see the manufacturer instructions.

After this installation phase, all cabinets are positioned, fastened, leveled, and anchored to the site floor.

Unpacking

When unpacking the cabinet, perform the following steps:

1. Open the cabinet case using the Vikex opener.
2. Lift the cabinet using a cabinet hoist or at least four people.
3. Place the cabinet on the floor in an upright position. Take extra care to avoid the cabinet from tipping over, as it is not yet secured to the floor.
4. Remove the plastic wrapping from the cabinet.
5. Move the cabinet to its position according to the floor marking, using a cabinet lifter or at least four people.

Cabinet Layout

Ensure that all preparations for placement of cabinets at the site, including floor marking, were done during the site planning stage, see the environmental spec for *MX-ONE SITE PLANNING*.

For examples of cabinet layouts at the MX-ONE site, see the environmental spec for *MX-ONE SITE PLANNING* .

Mounting Sets

This sections lists all the mounting sets used when mounting and grounding the BYB 501 cabinets. Refer to the relevant mounting set table in each installation step.

In the tables screws are named for example M 4X8, M 4 = metric thread 4 millimeters, and 8 = 8 millimeters in length.

Table 3.8: Cabinet Frame (normally mounted)

1/BYB 501 180 Cabinet Frame			
Pos.	**Title/Function**	**Product Number**	**Quantity**
	RACK FRAME, H=1800, METRIC, W=450	SXK 118 0444/1	1
	MOUNTING BAR, H=1800, METRIC	SXA 210 026/1	2
	SCREW M 4X8	24/SBF 228 040/0080	24
A, B	FOOT WITH ADJUSTING NUTS	SXK 118 0159/1	4
	DESIGNATION LABEL	SVH 290 51/2	2
	EARTHING PLATE	SXA 123 0760/1	4
	SCREW M 4X8	24/SBF 228 040/0080	8
	PUSH-BUTTON	SKY 117 01/4	2
	SCREW 3.5X9.5	SBF 131 279/24	2
	ESD WRISTSTRAP	LYB 250 01/141	1
	LABEL	SVB 129 16	1
	MARKING LABEL	2/SVF 191 040/2	1
	MARKING PLATE2	SVF 191 131/1	1

Positioning the Cabinet

1. Ensure that holes for tip protection or earthquake bracing frame have been drilled.
   If not use the rack and the tip protection or the earthquake bracing frame as a template.

2. Position the cabinet in line with other cabinets and the site walls, see the environmental spec for *MX-ONE SITE PLANNING* .

Leveling the Cabinet

Figure 3.15: Leveling the
Cabinet
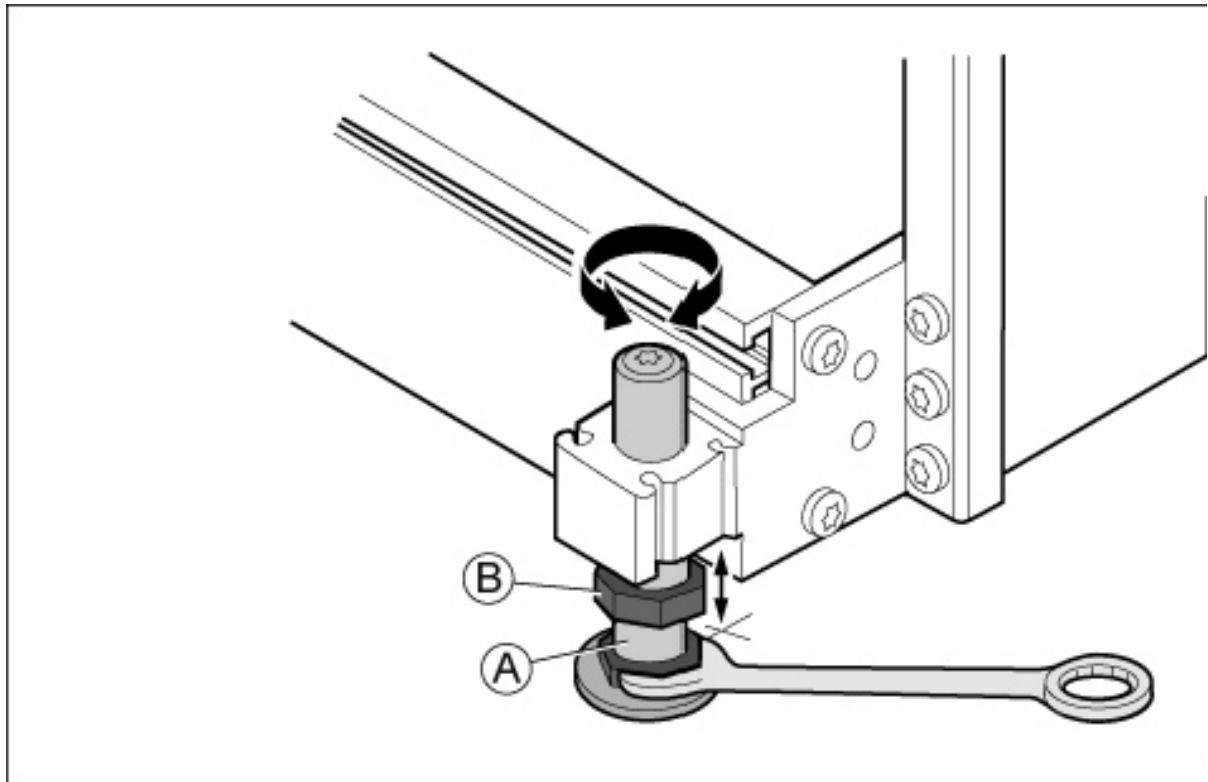
1. Level the cabinet by adjusting the feet (A) using the 24-mm U-ring wrench, see *Figure : Leveling the Cabinet*.

2. Verify that the cabinet is leveled horizontally and vertically, using a water level.

3. Tighten the locking nuts (B) on all feet using the 24-mm U-ring wrench, see *Figure : Leveling the Cabinet on*.

4. Proceed to the next installation stage:

   – For installation of a cabinet with tip protection, see *Installing the Cabinet with Tip Protection*.
   – For installation of a cabinet with earthquake bracing frames, see *Installing the Cabinet with Earthquake Bracing*.

Installing the Cabinet with Tip Protection

Table 3.9: Mounting Set for Tip Protection

18/BYB 501/4 Tip protection, generic			
Pos.	**Title/Function**	**Product Number**	**Quantity**
A	YOKE	SXA 123 0786/1	2
B	SPACER	SXA 123 0788/1	6
C	EXPANDER SCREW M 8X90	NSV 905 0805	4
D	INSULATING WASHER	SRB 186 080	4
E	SUPPORT	SXA 123 0785/1	4
F	CLAMP2	SXA 123 0787/1	4
G	NUT M 8	SBM 146 080/03	4
H	INSULATING PLATE	SXA 123 0789/1	4
	STUD SCREW M 8X650	SBK 255 70	4
	EXPANDER NUT M 8x30	SXA 113 2519	4
L	WASHER	SCA 101 080/03	8
	BUSHING	SRG 107 16/1	4
	WASHER	SCA 350 06	4

Figure 3.16: Installing the Tip Protection
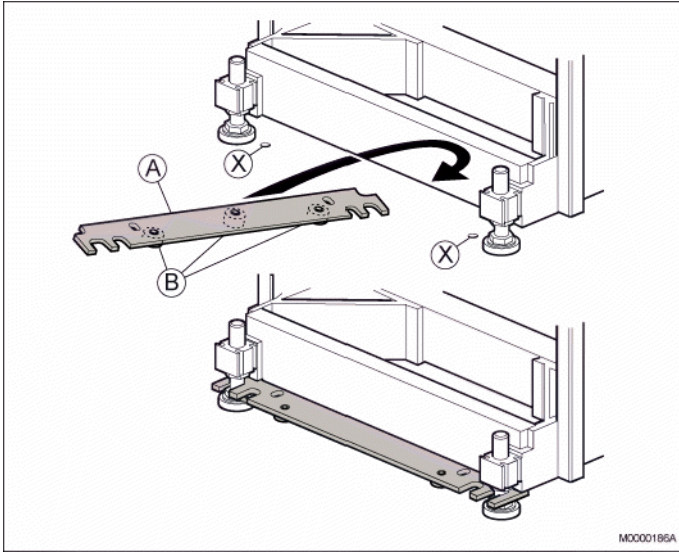
NOTE: The following procedure must be performed for the feet at the front and for the feet at the back:

1. Insert three spacers (B) in the holes in the yoke (A), see Figure Installing the Tip Protection on page 10

2. Slide the yoke under the cabinet between the feet.

3. Move the yoke back over the feet.

4. Align the holes in the yoke with the two anchoring holes (X) in the floor.

5. Anchor the cabinet to the floor according to the type of floor. For a concrete floor, see Installing the Tip Protection on a Concrete Floor on page 11. For a raised floor, see Installing the Tip Protection on a Raised Floor on page 12.

Installing the Tip Protection on a Concrete Floor

Figure 3.17: Installing the Expander
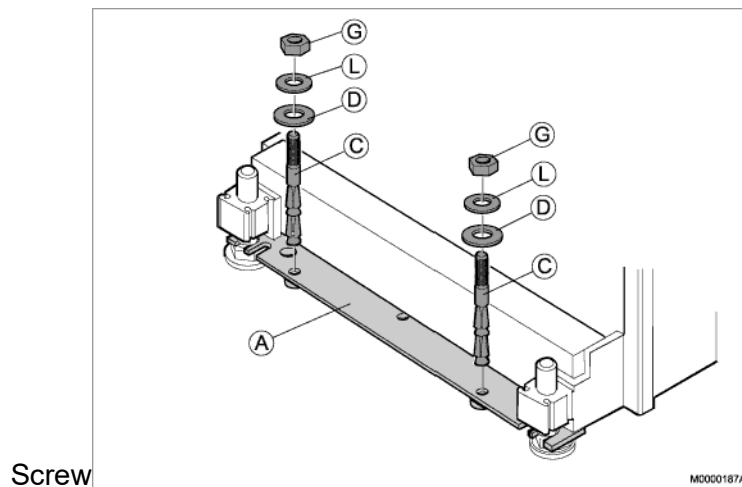
Screw

NOTE: The following procedure must be performed for the feet at the front and for the feet at the back:

1. Insert two expander screws (C) through the yoke (A) and into the concrete, see Figure 4 Installing the Expander Screw on page 11

2. Hammer the two expander screws into position. Be careful to the threads.

3. Install two insulating washers (D), two washers (L), and two nuts (G) on the two expander screws, see Figure 4 Installing the Expander Screw on page 11

4. Tighten the two expander screws.

5. Proceed to the next installation stage, see *Fastening the Cabinets*.

Installing the Tip Protection on a Raised Floor

Figure 3.18: Installing the Tip Protection on a Raised Floor
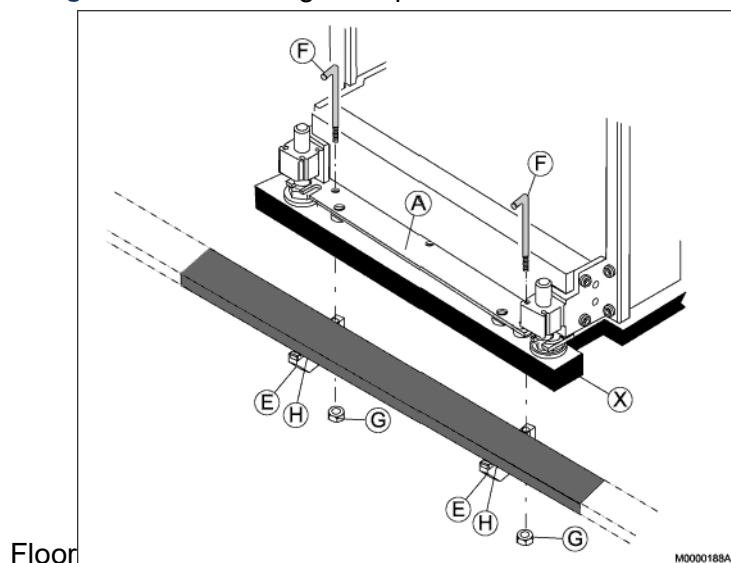
NOTE: The following procedure must be performed for the feet at the front and for the feet at the back:

1. Insert two clamps (F) through the yoke (A) and the floor (X), see Figure :Installing the Tip Protection on a Raised Floor.

2. Secure two supports (E) with two insulated plates (H) to the secondary section of the raised floor by using the two clamps (F) and two nuts (G).

3. Tighten the two nuts (G) from the underside.

4. Proceed to the next installation stage, see *Fastening the Cabinets*.

Installing the Cabinet with Earthquake Bracing

Table 3.10: Earthquake Set, Concrete Floor (Sheet 1 of 2)

17/BYB 501/1 (2 x SXK 118 0168/1) Earthquake Set, Concrete Floor			
Pos.	**Title/Function**	**Product Number**	**Quantity**
A	FIXING IRON	SXA 123 0380/1	4
B	BAR	SXA 123 0381/1	2
C	COASTER	SXA 123 0382/1	4
D	EXPANDER SCREW M 12/25	NSV 907 02	4

Table 3.10: Earthquake Set, Concrete Floor (Continued) (Sheet 2 of 2)

17/BYB 501/1 (2 x SXK 118 0168/1) Earthquake Set, Concrete Floor			
Pos.	Title/Function	Product Number	Quantity
E	INSULATING BUSHING	SXA 106 0093/2	4
F	WASHER	SCA 118 210/78	4
G	WASHER	SCA 118 170/78	4
H	SCREW M 16X25	03/SBA 186 160/0250	4

Figure 3.19: Installing the Earthquake
Bracing
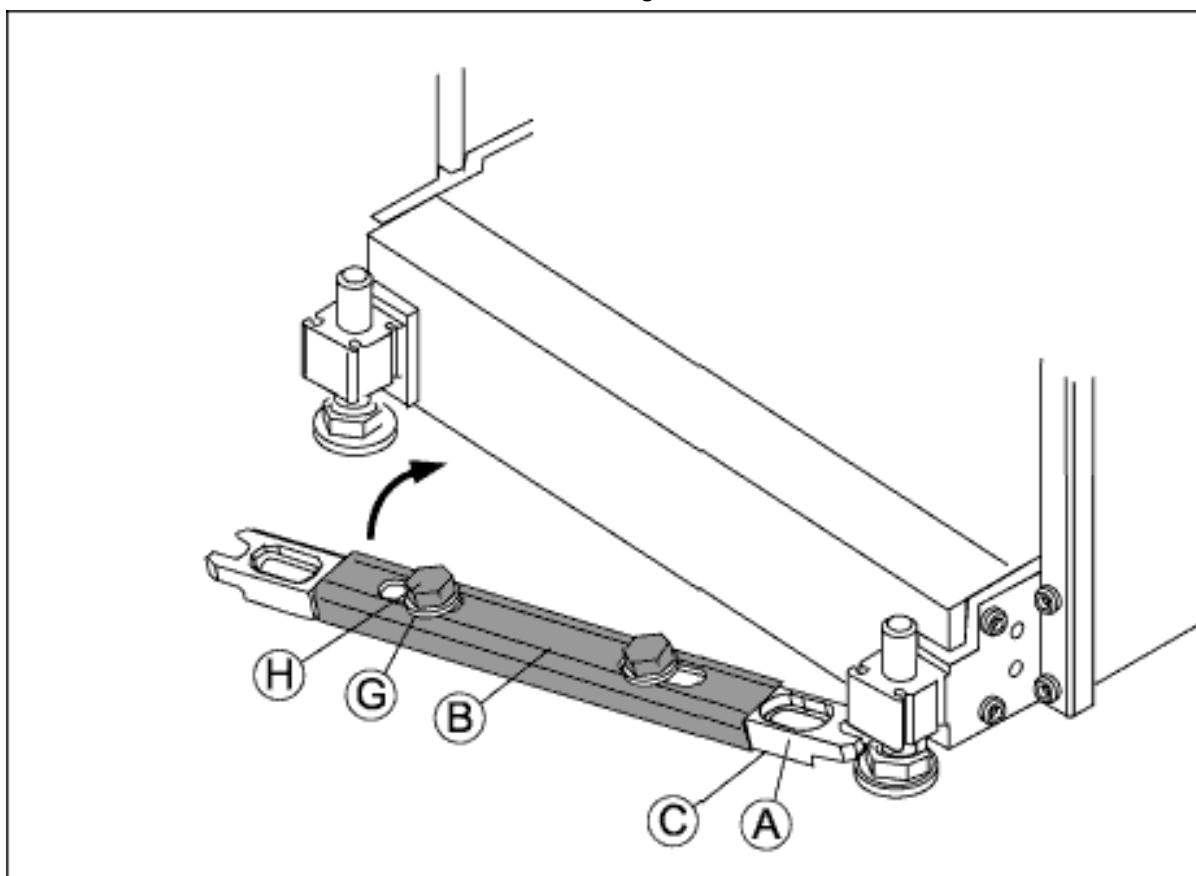
NOTE: The following procedure must be performed for the feet at the front and for the feet at the back:

1. Slide the earthquake bracing under the cabinet between the feet, see *Figure 7: Installing the Earthquake Bracing on page 14*.

2. Verify that two coasters (C) are installed under the two fixing irons (A).

3. Install the two fixing irons (A) between the feet of the cabinet with the bar (B), two screws (H), and two washers (G).

4. Align the holes in the fixing irons over the anchoring holes in the floor.

5. Tighten the two screws (H) to a torque of 80 Nm.

Anchoring the Cabinet on a Concrete Floor

Figure 3.20: Installing the Expander
Screw
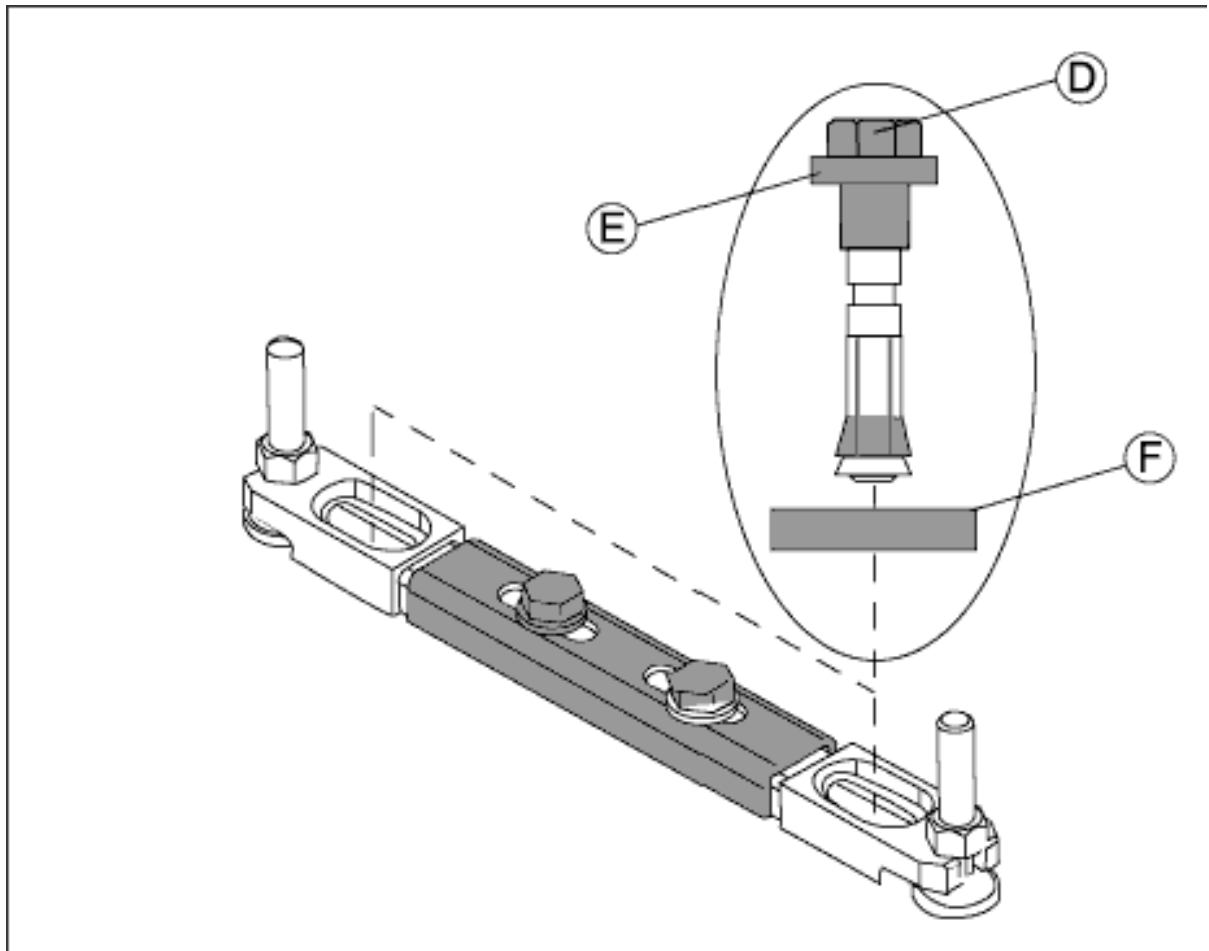
Figure 3.21: Securing the Earthquake
Bracing
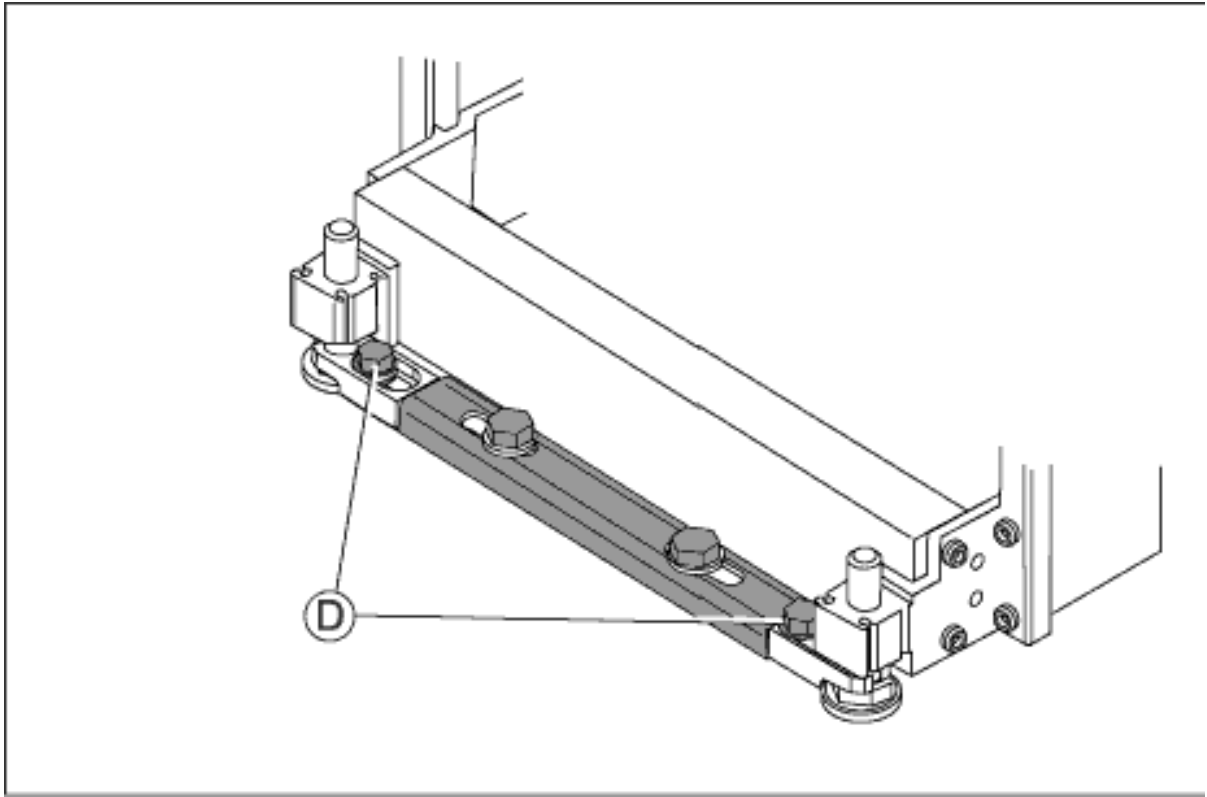
NOTE: The following procedure must be performed for the feet at the front and for the feet at the back:

1. Place two expander screws (D) with insulation bushing (E) and washer (F) through the fixing irons and into the concrete floor, see *Figure 8: Installing the Expander Screw on page 15*.

2. Hammer the two expander screws into position.

3. Secure the two expander screws and earthquake bracing by tightening the screws until the red caps snaps off, see *Figure 9: Securing the Earthquake Bracing* on page 15.

   NOTE: The red cap snaps off when the screw has been tightened to the proper torque, exposing a green washer. The green washer should be intact, with no breaks. If the washer is found damaged during inspection, the screw must be verified to have a minimum torque of 64 Nm (but not exceeding 68 Nm).

4. Proceed to the next installation stage, see *Fastening the Cabinets*.

Fastening the Cabinets

Fasten the cabinets to each other either side-by-side or back-to-back.

Fastening the Cabinets Back-to-Back

Table 3.11: Mounting Set, Back-to-Back

24/BYB 501/2 Mounting Set, Back-to-Back, d=800			
Pos.	Title/Function	Product Number	Quantity
B	SCREW	03/SBA 121 060/0160	12
A	GUIDE PIN2	SXA 123 0327/2	6

Figure 3.22: Fastening the Cabinets
Back-to-Back
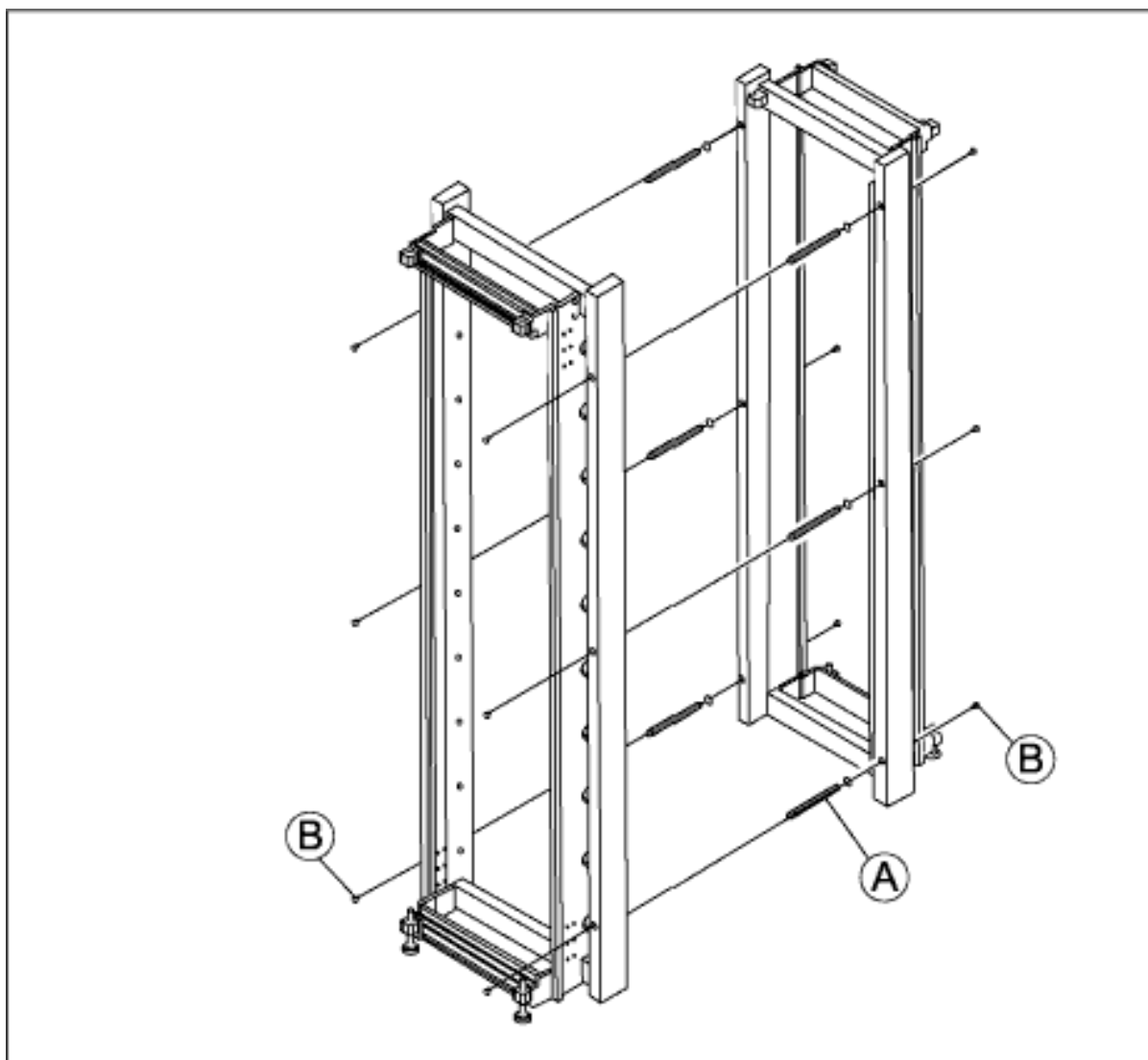
1. Position the two cabinets back-to-back, see *Figure 10: Fastening the Cabinets Back-to-Back* on page 17.
2. Adjust the two cabinets to an equal level.
3. Fasten the two cabinets back-to-back with six guide pins (A) and twelve screws (B).

4. Verify that the torque of all mounting screws is set to 10+/-0.5 Nm.

Fastening Cabinets Side-by-Side

Table 3.12: Mounting Set, Side-by-Side

14/BYB 501, Mounting Set, Side-by-Side			
Pos.	**Title/Function**	**Product Number**	**Quantity**
A	PLATE	SXA 123 0368/1	3
B	SCREW M 6X10	24/SBF 228 060/0100	12

Figure 3.23: Fastening the Cabinets
Side-by-Side
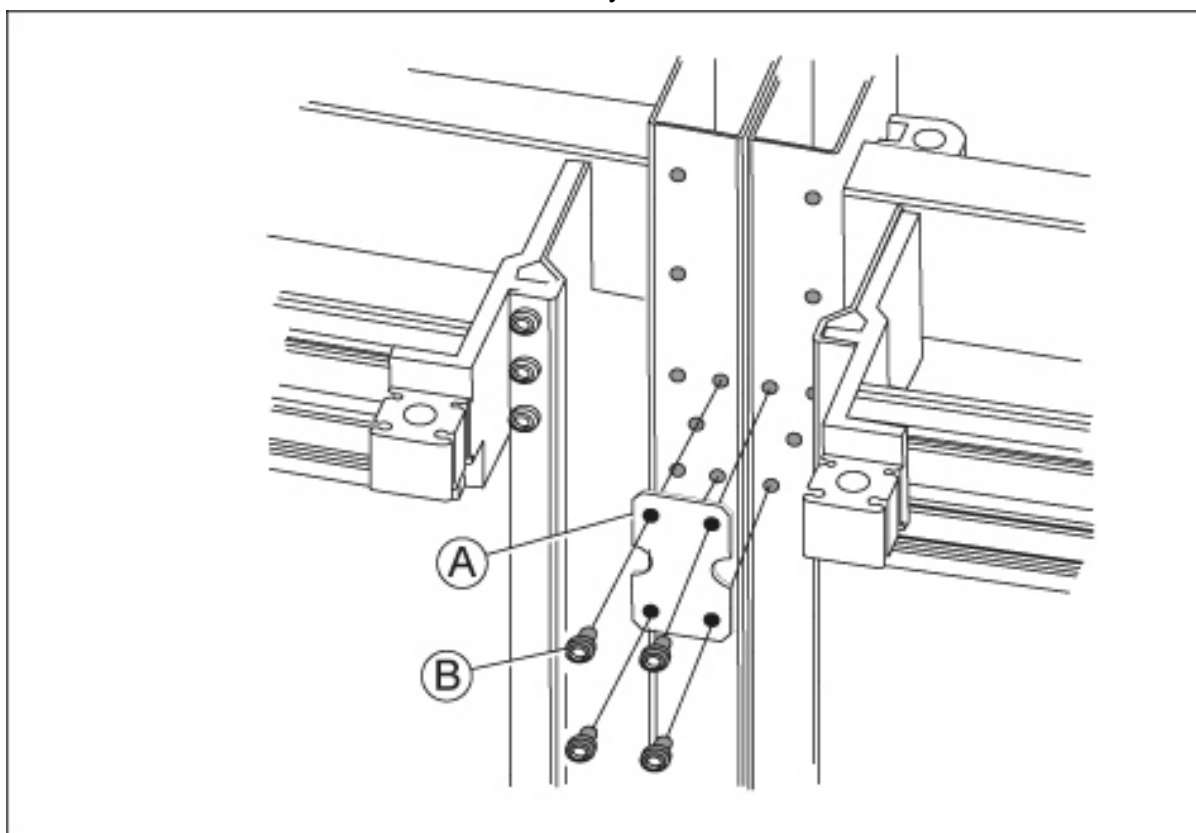
1. Position the two cabinets side-by-side, see *Figure 11: Fastening the Cabinets Side-by-Side* on page 18

2. Adjust the two cabinets to an equal level.

3. Fasten the two cabinets together side-by-side with three plates (A) and twelve screws (B) at the top, the middle, and the bottom of the two cabinets.

4. Verify that the torque of all mounting screws is set to 5+/-0.5 Nm.

Installing Supporting Captive Nuts

Supporting captive nuts are used to secure hardware units to the metal rack inside the cabinet. Insert the captive nuts in the square cabinet holes, see *Figure: Mounting the Captive Nuts in the Rack*.

NOTE: Check that the mounting bars for the captive nuts are positioned at least 100 mm behind the door.

Figure 3.24: Mounting the Captive Nuts in the Rack
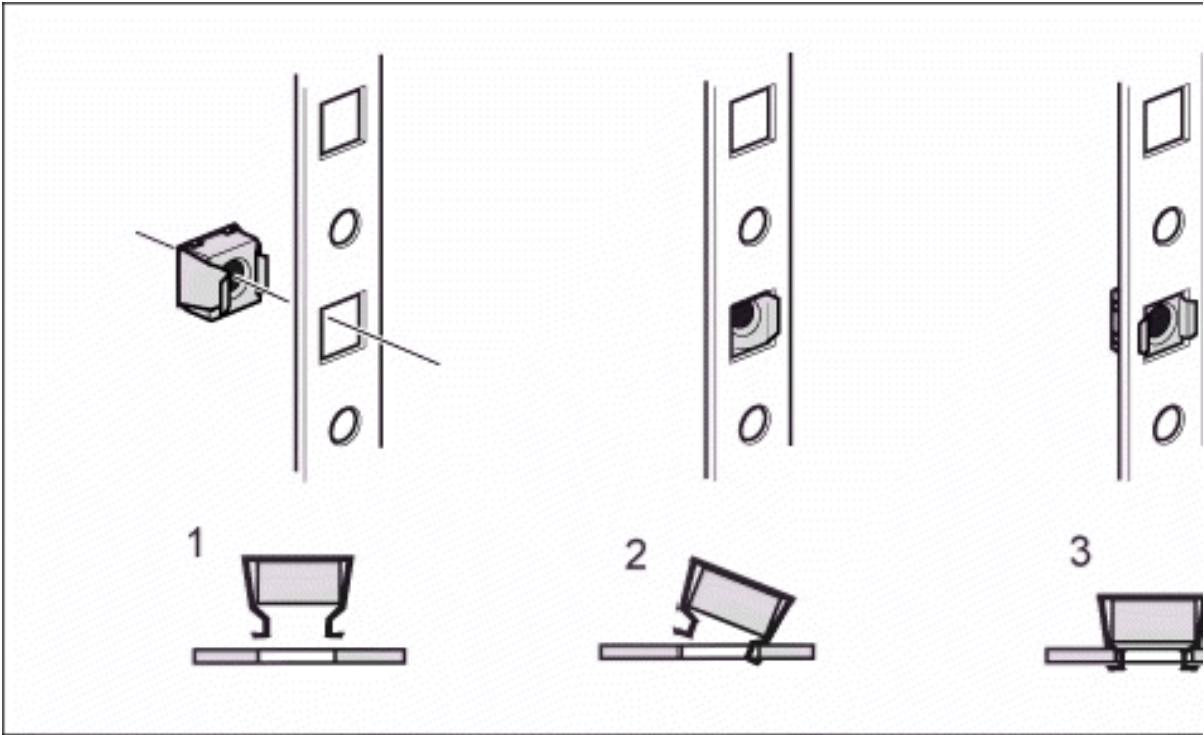
Installing Batteries

This section describes the installation of 31-Ah (BKB 201 003/1)and 62-Ah (BKB 201 003/2) batteries. Ensure to leave room in the cabinet for the bigger batteries (62 Ah) even when installing smaller batteries.

Begin battery installation by installing the battery shelf, that is supplied with the mounting set for the power equipment, at the bottom of the cabinet, see *Figure 13: Installing the Battery Shelf* on page 20.

Installing Battery Shelf

Use the following material set when installing the battery shelf:

Table 3.13: Material Set for Battery Shelf (Sheet 1 of 2)

NTM 144 266 Material set for battery shelf in 19-inch cabinet or frame			
Pos.	**Title/Function**	**Product Number**	**Quantity**
B	Battery shelf		1
L	Strapping belt		1

Table 3.13: Material Set for Battery Shelf (Continued) (Sheet 2 of 2)

NTM 144 266 Material set for battery shelf in 19-inch cabinet or frame			
Pos.	**Title/Function**	**Product Number**	**Quantity**
K	Set of 10-mm spacers for separating battery blocks		1
A	Captive nuts M6	SBM 173 060/03	4
C	Screws M6X16	78/SBA 121 060/0160	4

Figure 3.25: Installing the Battery Shelf
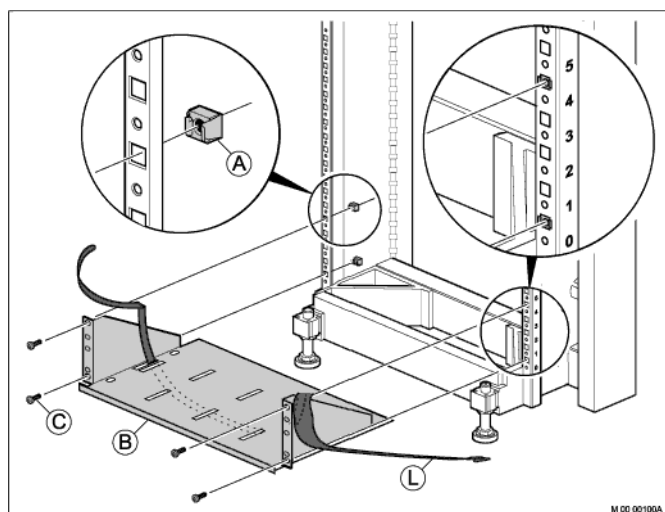
1. Mount four captive nuts (A) (*Installing Supporting Captive Nuts*) in the cabinet according to the number positions shown, see *Figure 13: Installing the Battery Shelf*.

2. Insert the strapping belt (L) through the battery shelf.

3. Fasten the battery shelf (B) using four screws (C).

Installing the Battery String

Use one of the following material sets when installing the batteries:

Table 3.14: Material Set for 48 V 31-Ah Battery

BKB 201 003/1 Material set for 48 V 31-Ah battery			
Pos.	**Title/Function**	**Product Number**	**Quantity**
A	Battery set	BKC 508 03/1	4
	Mounting set for battery	NTM 144 265	1

Table 3.15: Material Set for 48 V 62-Ah Battery

BKB 201 003/2 Material set for 48 V 62-Ah battery			
Pos.	**Title/Function**	**Product Number**	**Quantity**
A	Battery set	BKC 508 03/2	4
	Mounting set for battery	NTM 144 265	1

Table 3.16: Mounting Set for Battery (Sheet 1 of 2)

NTM 144 265 Mounting set for battery			
Pos.	**Title/Function**	**Product Number**	**Quantity**
B	SCREW M 8X25		2
C	SCREW M 8X16		8
D	TUBE SPACER 18 X16 metal		2
E	CONTACT WASHER for 6.3-mm flat lug terminals		3
F	PLAIN WASHER		8
G	SPRING WASHER		8
H	CONNECTOR BRIDGE		3
I	INSULATING COVER for plus and minus terminals		2
K	Set of spacers 10-mm for separating battery blocks		1
L	Grey double-insulated cable, 10 mm ^{2} area, 2 m long, (plus pole). (not UK)		1
M	Black double-insulated cable, 10 mm ^{2} area, 2 m long, (minus pole). (not UK)		1

Table 3.16: Mounting Set for Battery (Continued) (Sheet 2 of 2)

NTM 144 265 Mounting set for battery			
Pos.	**Title/Function**	**Product Number**	**Quantity**
	Battery service instruction sheet in a frame for wall mounting		1
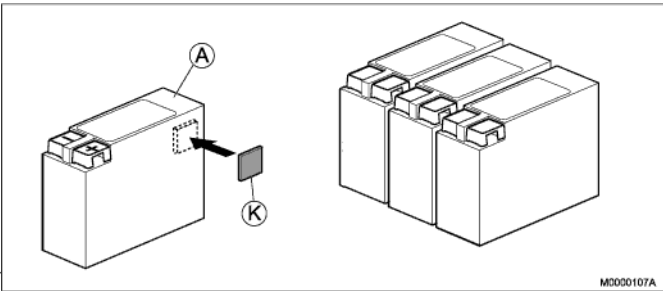
Figure 3.26: Battery Block Spacer
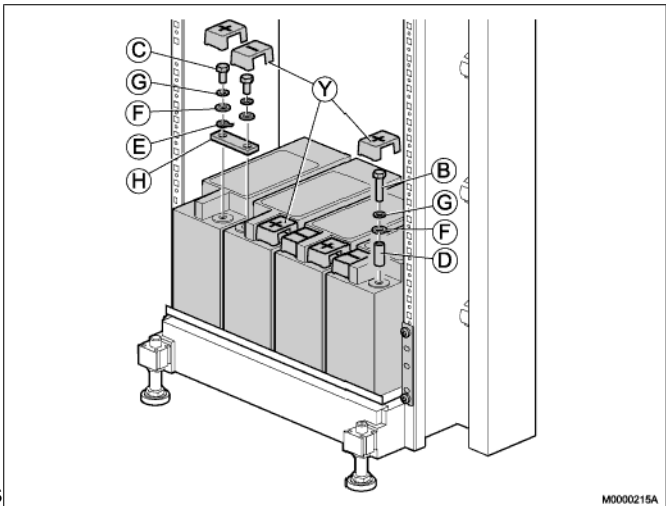
Figure 3.27: Installing the Batteries

NOTE: Before working on any equipment, be aware of the hazards involved with the electrical circuitry and be familiar with the standard practices for preventing accidents.

To mount the batteries in the battery shelf, perform the following steps:

1. Mount the spacers (K) between the battery blocks (A), see *Figure Battery Block Spacer*.

2. Place the safety strap through the slots in the battery shelf, see *Figure Battery String Safety Strap*.

3. Place the batteries on the shelf, see Figure Installing the Batteries. Make sure the front side of the batteries with the contact poles and the labels is facing the cabinet front.

4. Pull the batteries towards the shelf front edge.

5. Connect the batteries to each other by applying the connector bridge (H), plain washer (F), spring washer (G), by using the pole screws (C) from the batteries.

6. For measuring 12, 24, and 36 V DC insert three contact washers with flat lug terminals (E) on top of each connector bridge.

7. Tighten the six screws.

8. Apply the metal tube spacer (D), plain washer (F), spring washer (G), and 25-mm screw (B) on the plus pole of the rightmost battery block (do not tighten).

9. Apply the metal tube spacer (D), plain washer (F), spring washer (G), and 25-mm screw (B) on the minus pole of the leftmost battery block (do not tighten).

10. Position insulating pole covers (Y) on each of the four batteries, and press them down.

11. Place the strapping belt (L) around the batteries and tighten the strap, see *Figure Battery String Safety Strap*.

12. Fasten three warning labels, parallel connection of batteries (SVB 131 70), one on the right-hand side battery, and two at the bottom of the cabinet, see *Figure Parallel Connection of Batteries Warning Label* and see *Figure Warning Label SVB 131 70*.
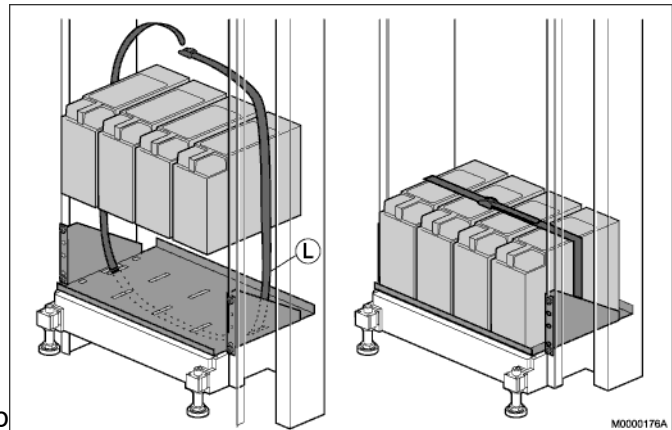
Figure 3.28: Battery String Safety Strap

Figure 3.29: Parallel Connection of Batteries Warning
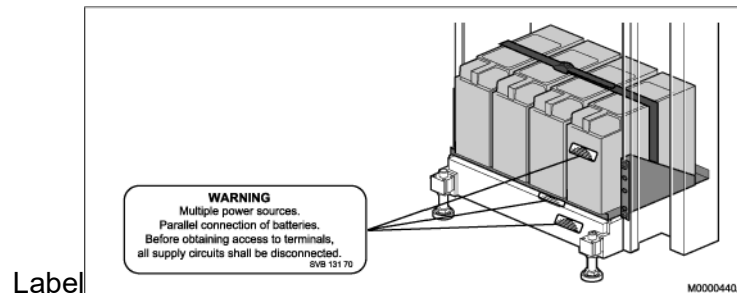
Label

Installing AC/DC Unit

This section describes the installation of the AC/DC power unit in the cabinet.

Before working on any equipment, be aware of the hazards involved with the electrical circuits and be familiar with the standard practices for preventing accidents.

The Power inlets to the AC/DC is on the rear side. Check that the power connection are accessible after mounting, else connect the Power cables before mounting. Also secure the Power cables with a cable tie, to avoid disconnection. see *Figure Secure Main cables*.

NOTE: It is mandatory to follow the suppliers Installation User guide/Manuals.

Installing the AC/DC Unit

The installation below is intended for the AC/DC unit 51305282. For specific information of the 51305282, see supplier Instruction Manual doc No. PM110_6500_00, and Quick Install Guide doc No. 110_6500_00-QR.

If any other type of AC/DC unit are installed, the same step below shall be taken.

NOTE: The AC/DC unit can have a shelf mounted below. This will ease the electrical connection. The shelf to be used is 86/BYB501. See *Installing a Cabinet Shelf* for more information.

Figure 3.30: Installing AC/DC Unit
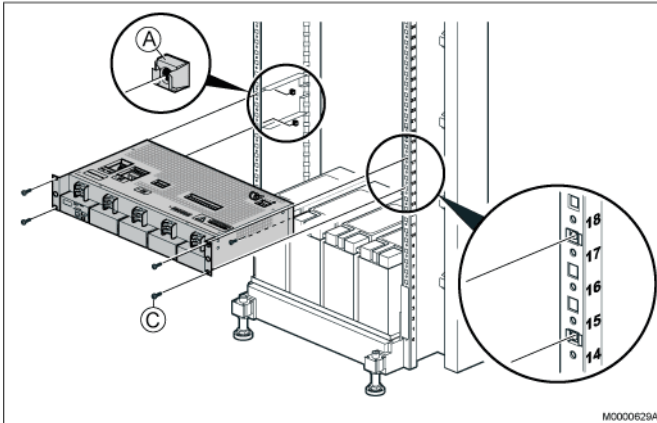
1. If not already done, mount captive nuts (A) (see *Installing Supporting Captive Nuts*).

2. Place the AC/DC unit on the mounted shelves (86/BYB501).

3. Use the four screws (C) supplied with the mounting kit to fasten the AC/DC unit to the captive nuts in the cabinet. Do not tighten the screws, as they need to be opened again when connecting cables to the AC/DC unit.

4. Connect the mains supply, distribution/load cables and battery cable acc to manufacturers instruction/manual.

    NOTE: Do not Power up the Unit in this stage.

5. Fasten the warning label, energy hazard (SVB 131 75) as close as possible to the circuit breakers on the front of the AC/DC unit.

M8 Pole Bolt (On the Battery Side)
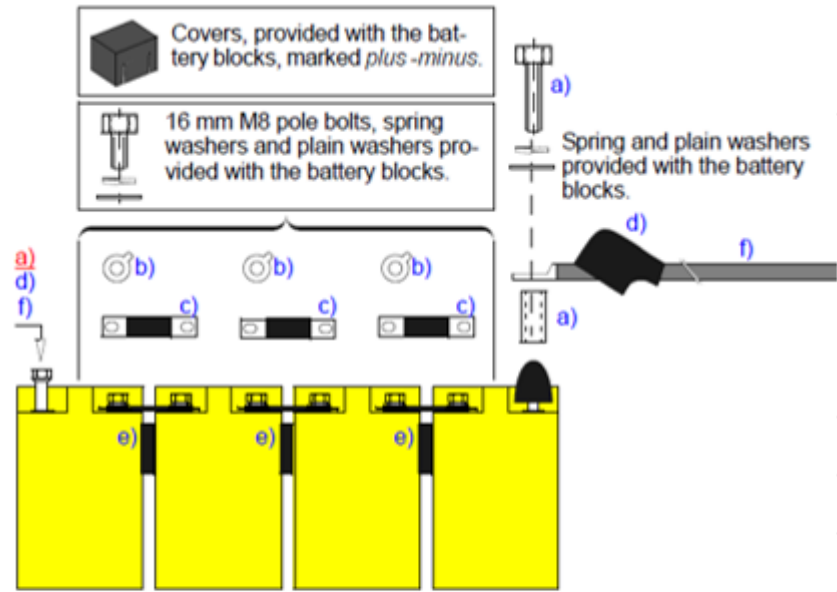
Figure 1

a) 2 of each;
    – 25 mm M8 bolt,
    – 18 x 16 metal tube spacer

Figure 3.31: M8 Pole Bolt

Installing MX-ONE Classic

This section describes the installation of the subracks containing the MX-ONE Classic boards in the cabinet.

NOTE: This section does not describe the installation of separate boards in the subrack. The MX-ONE Classic consists of one subrack.

NOTE: This equipment have to be connected to protective ground. Connect a grounding cable to the bracket at the earthing point, close to the earthing symbol located at the right hand side of the chassis. See *Figure 19: Earthing point 7U-chassis* on page 25.

Figure 3.32: Earthing point
7U-chassis

This section also describes installation of two subracks, the upper called A and the lower called B. Both can of course be a Subrack A.

Use the following material sets when installing the MX-ONE Classic and Fan Unit:

NOTE: If only one subrack is to be installed mount the lower air plate on this subrack. To fulfill the demands on Fire Enclosure for the 7U chassis, the Air plate SXA1122330/1 included in NTM144262 have to be mounted.

For instructions see *Introduction*.

Table 3.17: Mounting Set for Subrack A

NTM 144 262 Mounting set for subrack A			
Pos.	**Title/Function**	**Product Number**	**Quantity**
D	AIR PLATE, upper	SXA 112 2329/1	1
E	AIR PLATE, lower	SXA 112 2330/1	1
C	SCREW M 6X16	78/SBA 121 060/0160	8
A	CAPTIVE NUT M6	SBM 173 060/03	8
F	SCREW M 4X6	24/SBF 228 040/0060	2
G	CABLE LUG	SNG 804 23	1
K	LABEL FOR ESD	SVB 129 05/2	1

Table 3.18: Mounting Set for Subrack B

NTM 144 263 Mounting set for subrack B			
Pos.	**Title/Function**	**Product Number**	**Quantity**
H	Air plate, front	SXA 112 2331/1	1
I	Air plate, rear	SXA 112 2332/1	1
C	SCREW M 6X16	78/SBA 121 060/0160	4
A	CAPTIVE NUT M6	SBM 173 060/03	4
F	SCREW M 4X6	24/SBF 228 040/0060	2
G	CABLE LUG (only used if the two subracks are mounted in separate cabinets)	SNG 804 23	1
K	LABEL FOR ESD (only used if the two subracks are mounted in separate cabinets)	SVB 129 05/2	1

Mounting the Lower Air Plate

Figure 3.33: Mounting the Lower Air
Plate
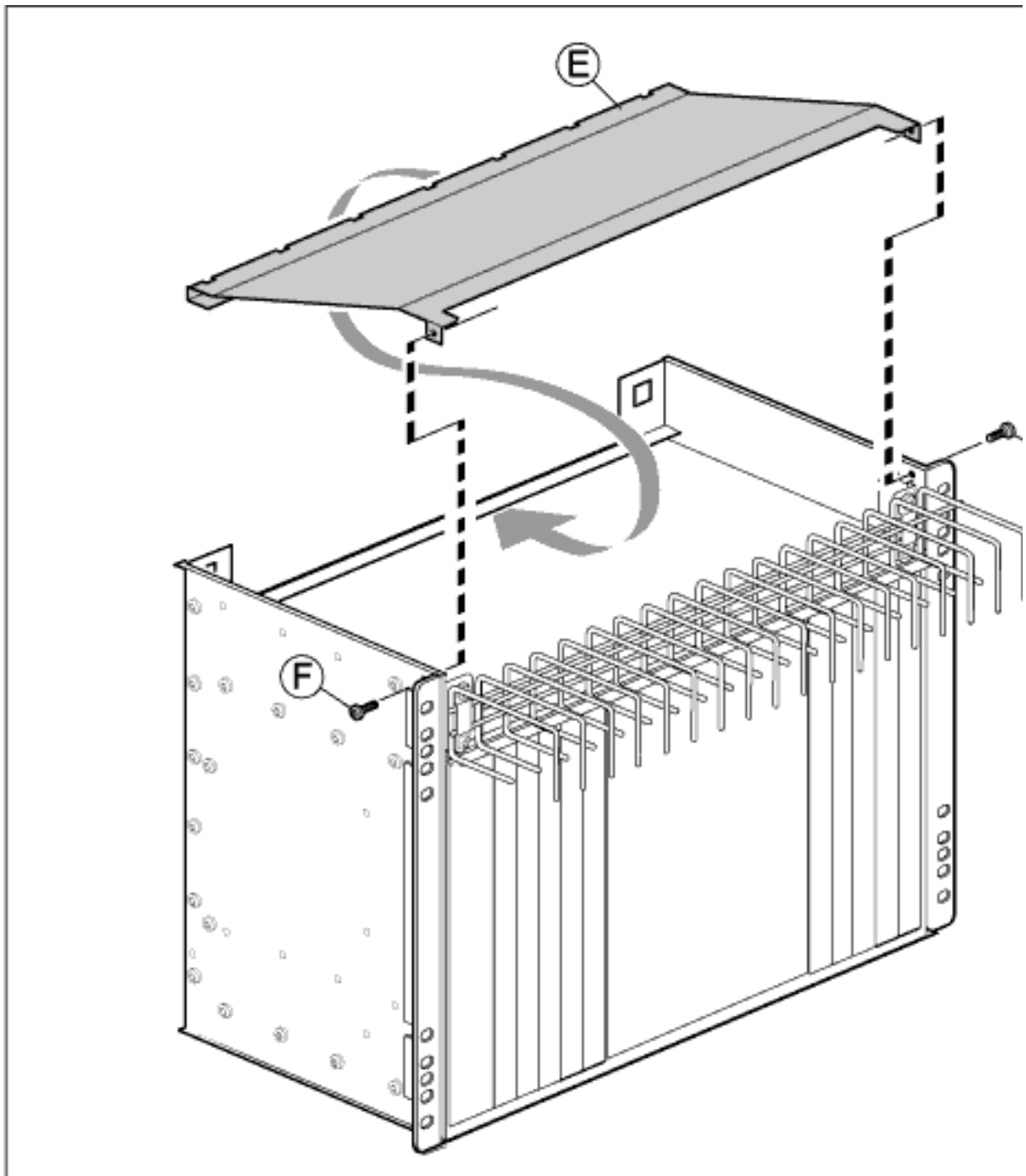
Before installing subrack B, install the lower air plate in the subrack. Perform the following steps:

1. Place subrack B in an upside-down position on a steady surface.
2. Insert the edge of the lower air plate (E) in the slot at the rear side of the subrack.
3. Lower the air plate to level it with the screw holes in the subrack, as demon-strated by the dotted line.

4. Fasten the air plate to the subrack from both sides using two screws (F).

Parts from this mounting set are used when installing the fan unit, leave the remaining parts at hand.

Installing Subrack B (or Second Subrack A)

Figure 3.34: Installing Subrack
B
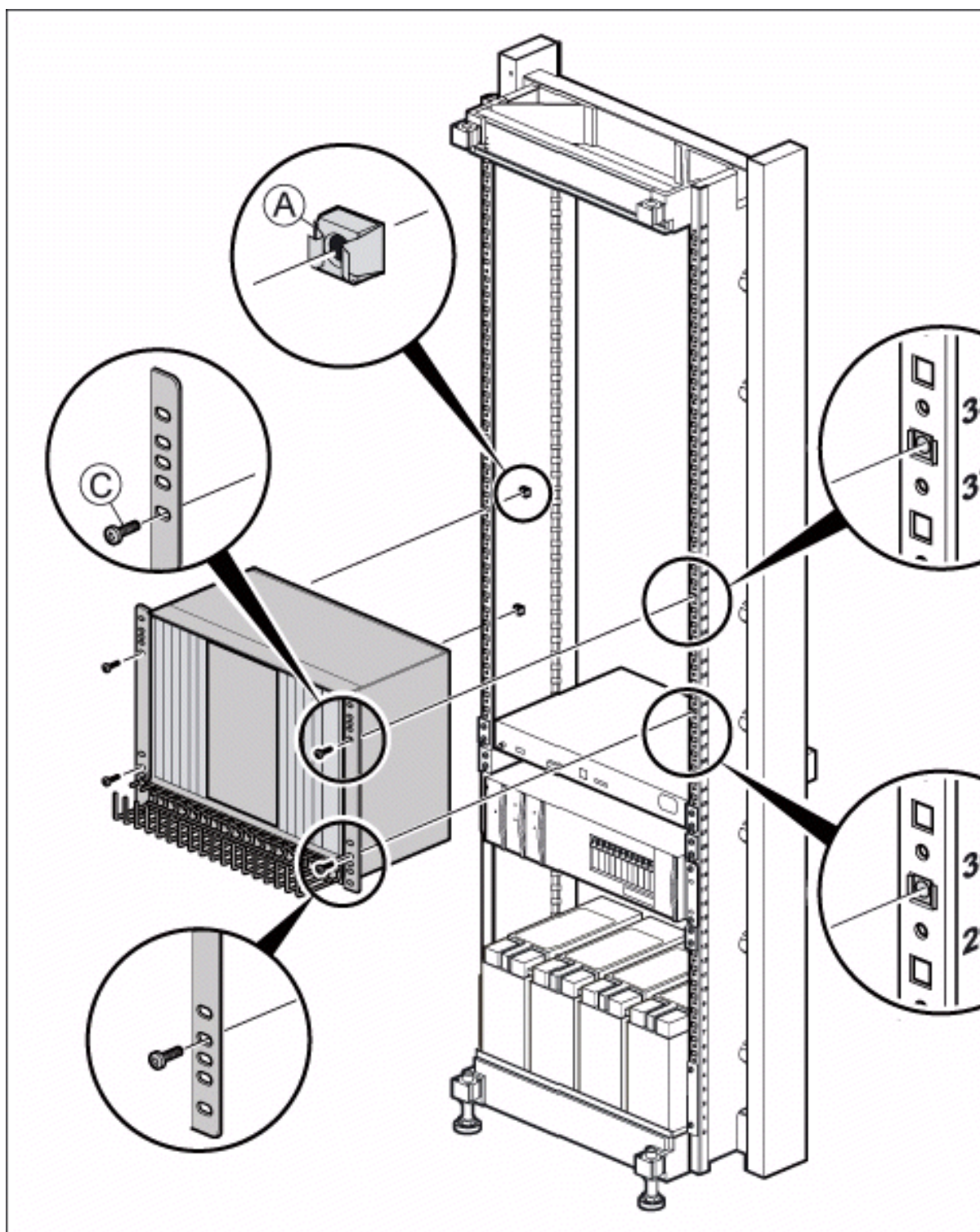
The lower air plate is only mounted in subrack B (lower subrack if two subracks are mounted onto of each others), see Mounting the Lower Air Plate on page 26. In subrack A (upper subrack), front and rear air plates are installed instead.

1. Mount four captive nuts (A) (see *Installing Supporting Captive Nuts*) according to the number positions shown.

2. Use the screws (C) to fasten the subrack to the captive nuts in the cabinet. It is very important to use the correct holes in the subrack brackets. For the correct holes.

Parts from this mounting set are used at a later installation stage, leave the remaining parts at hand.

Mounting the Front Air Plate in Subrack A

Figure 3.35: Mounting the Front Air Plate in Subrack A
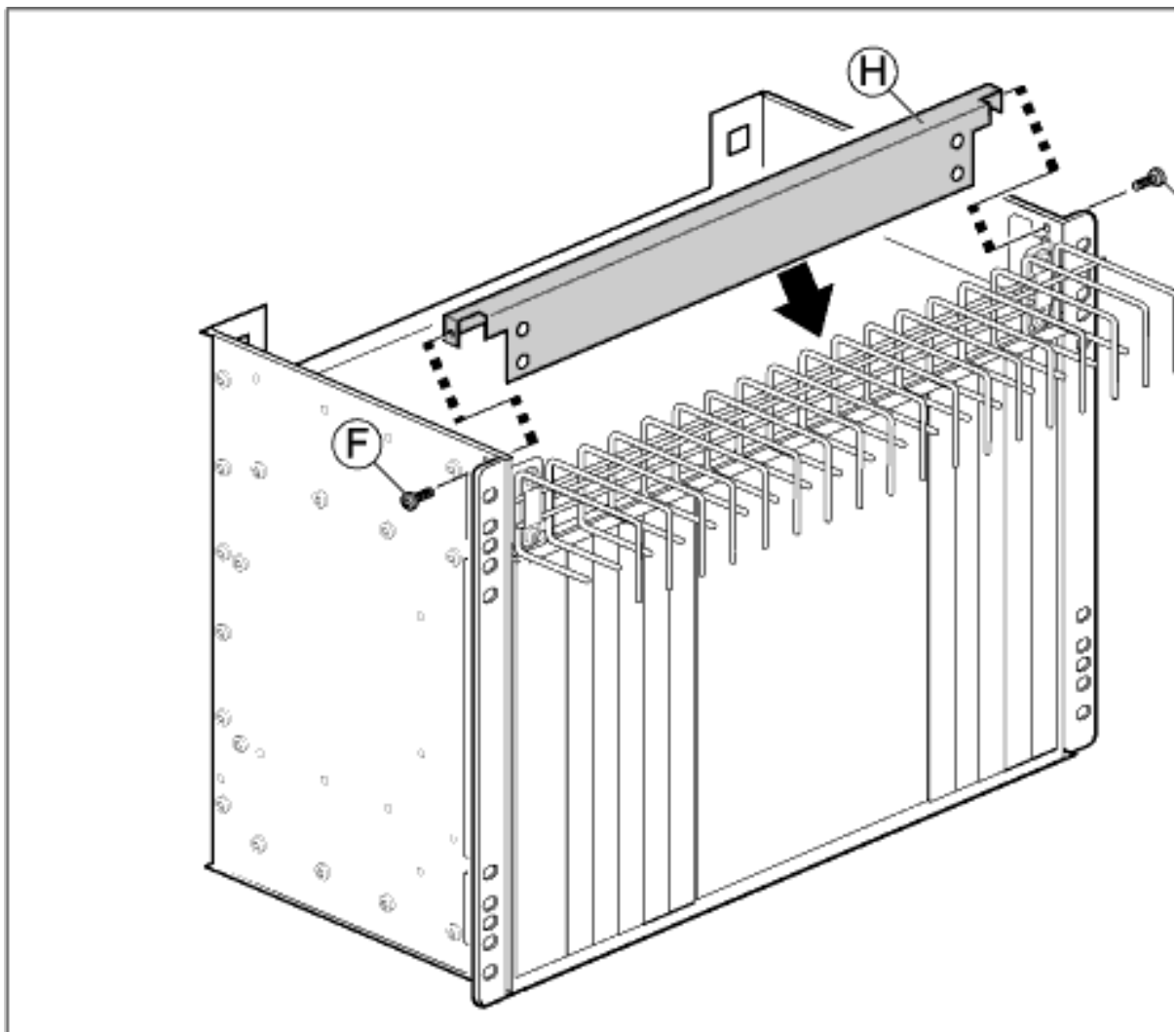
To prepare subrack A for installation in the cabinet, first mount front and rear air plates in the subrack as follows:

1. Place subrack A in an upside-down position on a steady work surface.

2. Insert the front air plate (H) to the slot against the cable chute.

3. Fasten the front air plate to the subrack by using two screws (F).

Parts from this mounting set are used at a later installation stage, leave the remaining parts at hand.

Mounting Rear Air Plate in Subrack A

Figure 3.36: Mounting Rear Air Plate in Subrack A
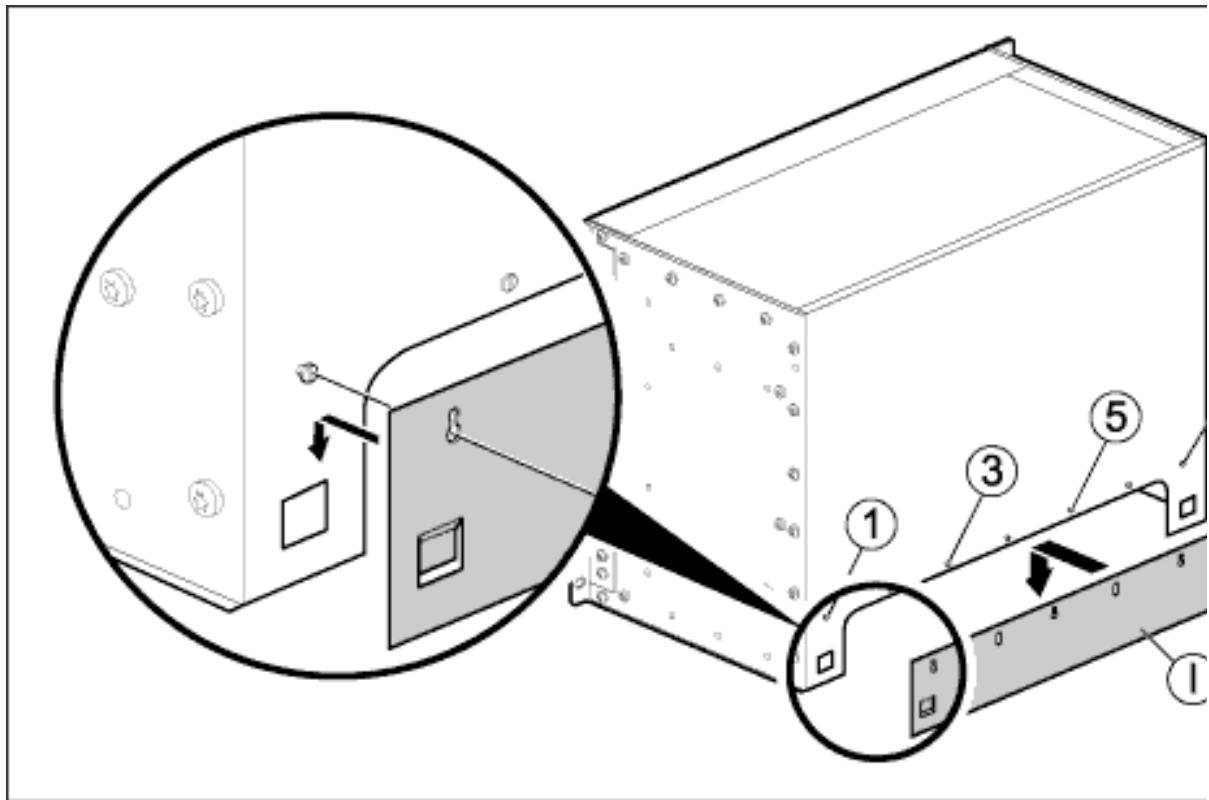
1. Turn subrack A back to an upright position.
2. Loosen, but do not remove the screws (1, 3, 5, and 7) on the back panel of the subrack, so they stick out a few millimeters. Note that only these four screws should be loosened.

3. Position the four key holes of the rear air plate on the half-released subrack screws and slide down the air plate. Make sure that the squared plates hook into position.

4. Fasten the screws 1, 3, 5, and 7.

Parts from this mounting set are used at a later installation stage, leave the remaining parts at hand.

Installing Subrack A

NOTE: Ensure that the front and rear air plates are mounted.

For more information, see *Mounting the Front Air Plate in Subrack A* and *Mounting Rear Air Plate in Subrack A*.

Figure 3.37: Installing Subrack A
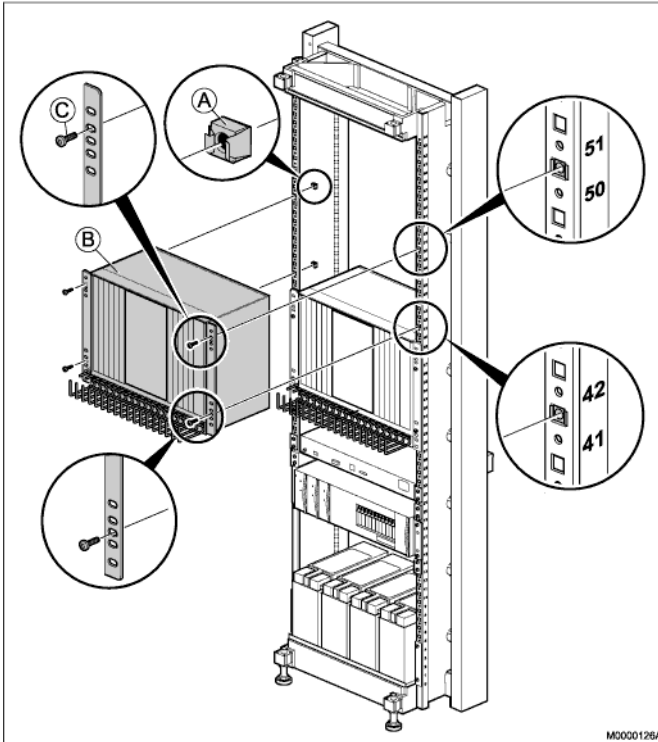
To install subrack A, perform the following steps:

1. Mount four captive nuts (A) (see *Installing Supporting Captive Nuts*) according to the number positions shown.

2. Use the screws (C) to fasten the subrack A to the captive nuts in the cabinet.

Ensure that no gap is left between subracks A, and B.

Parts from this mounting set are used at a later installation stage, leave the remaining parts at hand.

Installing Upper Air Plate

NOTE: The upper air plate is only mandatory if hardware will be installed above the fan unit.

Figure 3.38: Installing Upper Air Plate
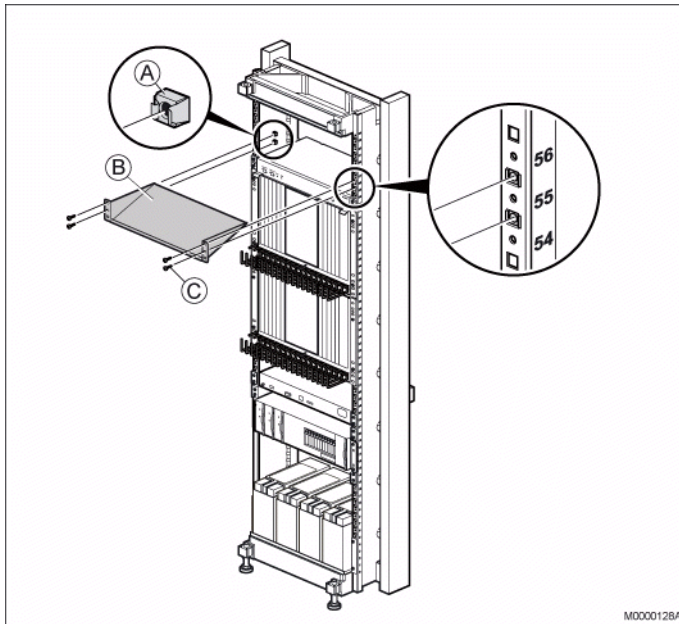
To install the upper air plate, perform the following steps:

1. Mount four captive nuts (A) (see *Installing Supporting Captive Nuts*) according to the number positions shown.

2. Fasten the air plate (B) to the four captive nuts in the cabinet using the four screws (C).
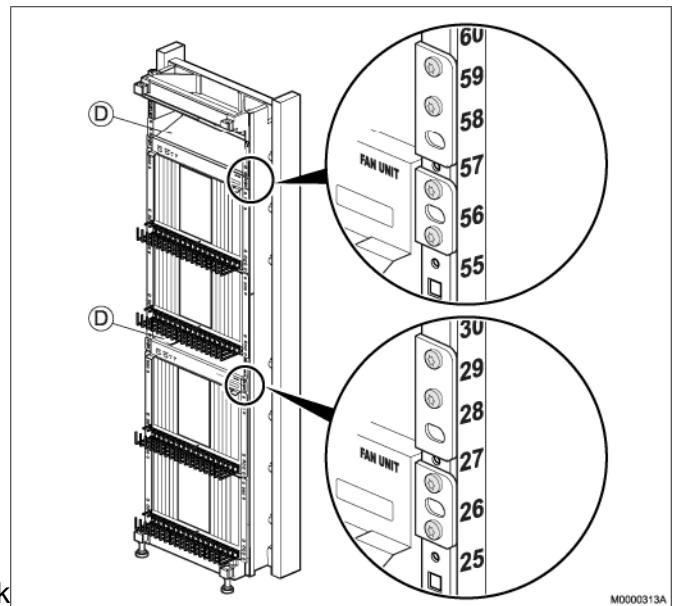
Figure 3.39: A four MX-ONE Classic Rack

When installing a four-MX-ONE Classic-equipped exchange cabinet (2 x subrack A+B or A+A) without internal power and batteries, two fan units with upper air plates (D) are mounted in the cabinet.

Installing the Fan Unit

This section describes the installation of fan unit and upper air plate in the cabinet.

Table 3.19: Mounting Set for Fan Unit

52/BYB 501 Mounting Set included in Fan Unit BFD 509 08/4			
Pos.	**Title/Function**	**Product Number**	**Quantity**
D	SLIDE	SXA 123 0320/1	2
E	SPRING	SXA 123 0321/1	2
F	SCREW	24/SBF 228 040/0080	2
C	SCREW M 6X16	03/SBA 121 060/0160	4
A	CAPTIVE NUT M6	SBM 173 060/03	4

Figure 3.40: Installing Slides
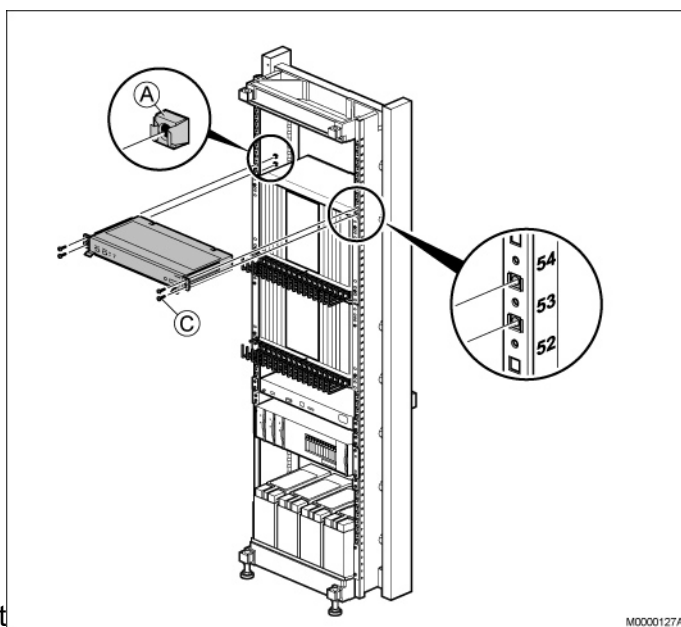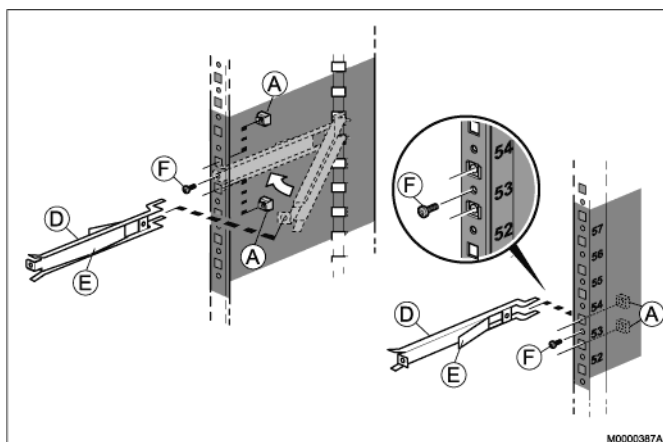
Figure 3.41: Installing the Fan Unit

- Mount four captive nuts (A) (see *Installing Supporting Captive Nuts*).
- Insert the two slides (D) with springs (E),and fasten them with the two screws (F).

- Slide the fan unit in position.
- Fasten the fan unit to the four captive nuts (A) in the cabinet. using the four screws (C).

Ensure that no gap is left between subrack A, and the fan unit.

Installing Servers

Install the standard servers in a standard server cabinet (locally sourced). Install the 1U chassis including the ASU in a BYB 501 cabinet.

For the installation procedure for the standard server cabinet, refer to manufacturer instructions.

Installing MX-ONE 1U chassis

This section describes how to install the 1U chassis, MX-ONE 1U in the BYB 501 cabinet. Additional 1U chassis can be installed directly above the first one in the same way as the first 1U chassis.

Use the following mounting set to install the MX-ONE 1U chassis in the cabinet.

Table 3.20: Mounting Set for 1U chassis, MX-ONE Service Node

NTM 144 264 Mounting set			
Pos	**Title/Function**	**Product Number**	**Quantity**
C	SCREW M 6X16	78/SBA 121 060/0160	4
A	CAPTIVE NUT M6	SBM 173 060/03	4

To install the 1U chassis in the cabinet, perform the following steps:

NOTE: Power inlets are positioned on rear side of the chassis. Secure that rear side is accessible after mounting, or insert the 48V and/or the 115/230V Mains cable before mounting in the rack. Fasten all power cables by Cable tie to avoid disconnection. See *Figure Secure Main cables*.

NOTE: This equipment have to be connected to protective ground. Connect a grounding cable to the bracket at the earthing point, close to the earthing symbol located at the rear side of the chassis. See *Figure Secure Main cables*.

Figure 3.42: Installing MX-ONE 1U
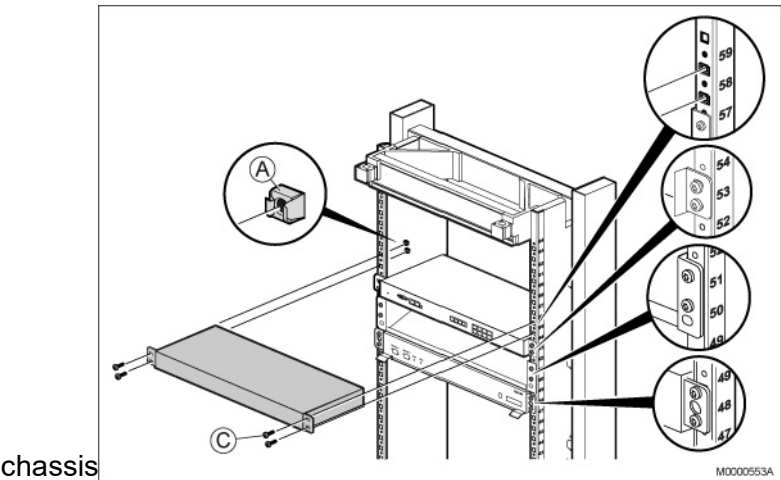
chassis

1. Mount four captive nuts (A) (see *Installing Supporting Captive Nuts*).
2. Fasten the 1U chassis to the four captive nuts in the cabinet, using the four screws (C).

3. If required, install additional 1U chassis directly above the first one in the next available cabinet position. No gap is needed between the units.

NOTE: Do not obstruct the cooling air flow, which goes from right to left in the MX-ONE Lite (3U) and MX-ONE 1U subrack.
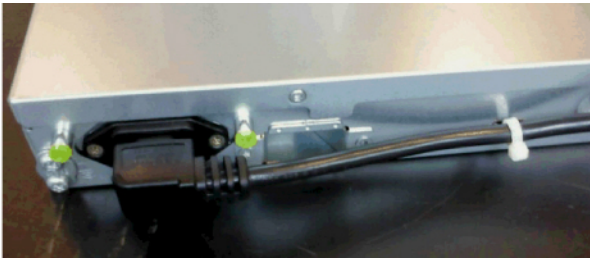
Figure 3.43: Secure Main cables

Installing MX-ONE Lite 3U

This section describes the installation of MX-ONE Lite subracks in the BYB 501 cabinet.

Use the following mounting set to install the MX-ONE Lite subrack in the cabinet.

NOTE: 110/240V Mains power inlets are positioned on rear side of the MX-ONE Lite. Secure that rear side is accessible after mounting, or insert the Mains cable before mounting in the rack. Fasten all power cables by Cable tie to avoid disconnection. See *Figure 30: Secure Main cables* on page 36.

NOTE: This equipment have to be connected to protective ground. Connect a grounding cable to the bracket at the earthing point, close to the earthing symbol located at the rear side of the chassis. For an example see *Figure 30: Secure Main cables* on page 36.

Table 3.21: Mounting Set for MX-ONE Lite subrack (Sheet 1 of 2)

NTM 144 264 Mounting set			
Pos.	**Title/Function**	**Product Number**	**Quantity**
C	SCREW M 6X16	78/SBA 121 060/0160	4

Table 3.21: Mounting Set for MX-ONE Lite subrack (Continued) (Sheet 2 of 2)

NTM 144 264 Mounting set			
Pos.	**Title/Function**	**Product Number**	**Quantity**
A	CAPTIVE NUT M6	SBM 173 060/03	4

Figure 3.44: Installing MX-ONE Lite
subrack
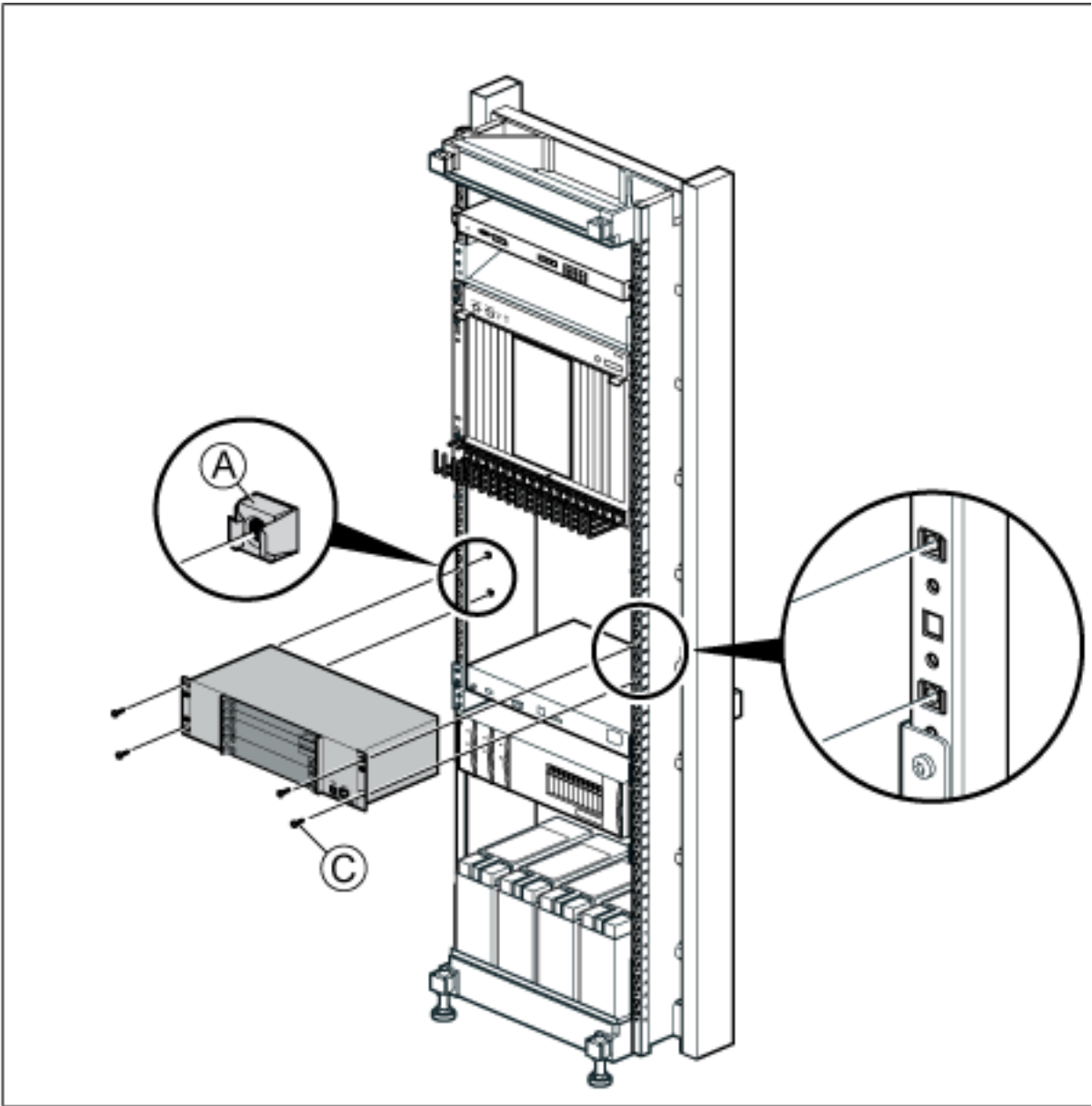
To install the MX-ONE Lite in the cabinet, perform the following steps:

1. Mount four captive nuts (A) (see *Installing Supporting Captive Nuts*) at a chosen position. The MX-ONE Lite has mounting holes to fit both metric and inch measured cabinets.

2. Fasten the MX-ONE Lite to the four captive nuts in the cabinet, using the four screws (C), see on page 37.

3. Additional MX-ONE Lite units can be mounted directly above or below the first one. No gap is needed between the units as they have their own cooling systems.

NOTE: Do not obstruct the cooling air flow, which goes from right to left in the MX-ONE Lite and Slim subrack

Installing a Cabinet Shelf

This section describes the installation of a cabinet shelf in the cabinet.

NOTE: The cabinet shelf is optional, and could be used for a portable computer or a heavy unit i.e the 2U Power unit.

Table 3.22: Cabinet Shelf

86/BYB 501/2 Cabinet Shelf			
Pos	**Title/Function**	**Product Number**	**Quantity**
D	SHELF	SXA 210 44/2	1
E	FIXING BRACKET (factory mounted)	SXA 123 0417/1	2
F	SCREW M 4X8 (factory mounted)	24/SBF 228 040/0080	4
G	SLIDE	SXA 123 0320/2	2
A	CAPTIVE NUT M 6	SBM 173 060/03	2
C	SCREW M 6X16	03/SBA 121 060/0160	2

Figure 3.45: Installing Cabinet
Shelf
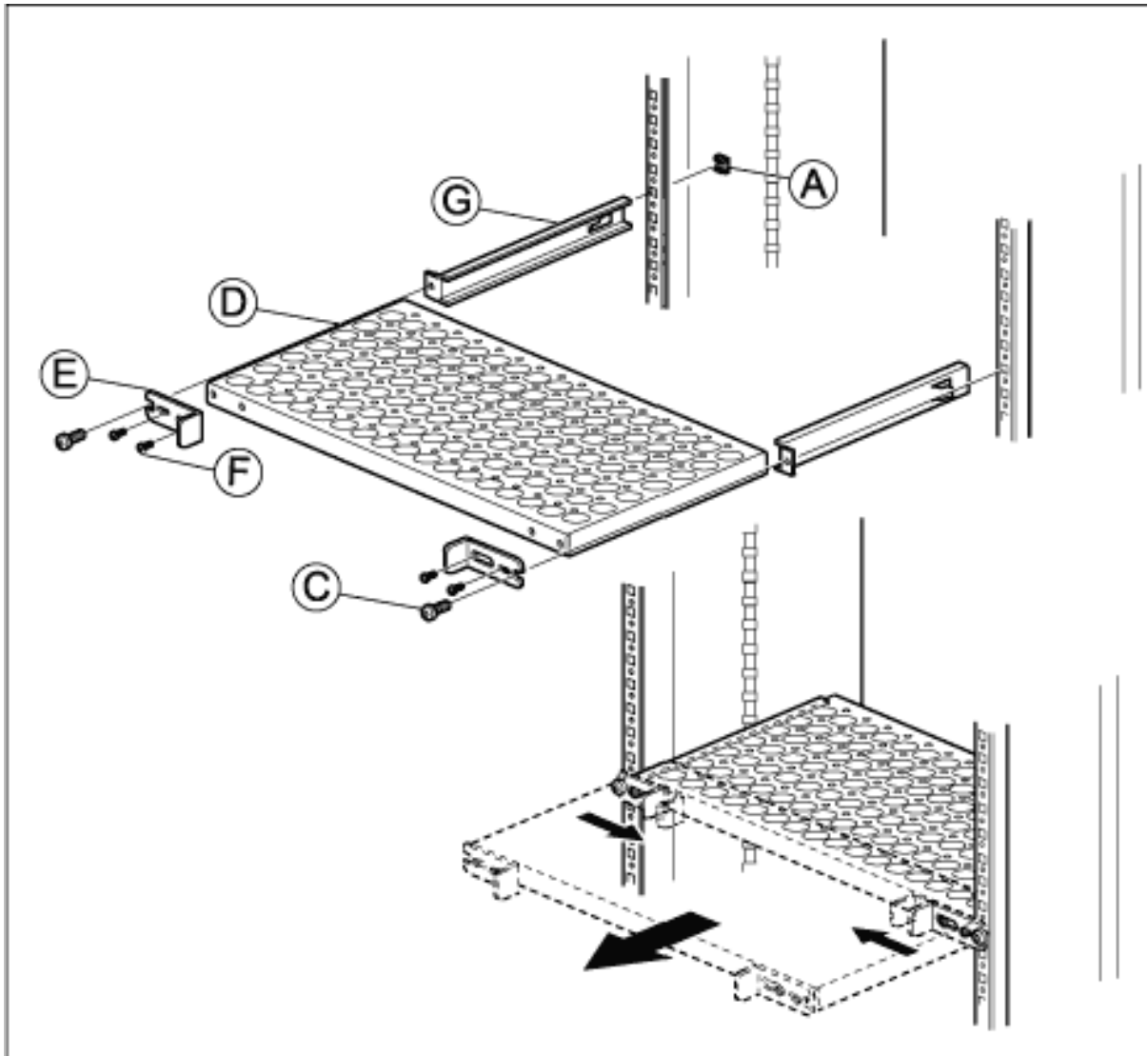
To install the cabinet shelf, see on page 38, and perform the following steps:

1. Mount two captive nuts (A) (see *Installing Supporting Captive Nuts*) at the chosen position for the shelf.

2. Fasten the two slides (G) to the two captive nuts in the cabinet using the two screws (C) and then loosen the screws.

3. Loosen the four screws (F) slide the two fixing brackets (E) against each other on the shelf and push the shelf (D) into the two slides (G).

4. Slide the two fixing brackets (E) outwards behind the two screws (C), then tighten the four screws (F).

5. Finally fasten the shelf (D) by tighten the two screws (C).

Labeling

Before cabling the cabinet it is necessary to label the media gateway parts used per Server, using the labels provided in label sets SVH 277 02/1 - /5, see Table 17: Gateway Labels on page 39. The cabinet must be labeled with the number of Servers that is installed in the cabinet. It is recommended to label the following items:

- Cabinet
- MX-ONE 1U
- MX-ONE Lite (3U-chassis)
- MX-ONE Classic (7U-chassis)
- AC/DC
- Other servers

Table 3.23: Gateway Labels

Product Number	Server Number
SVH 277 02/1	1 - 10
SVH 277 02/2	11 - 20
SVH 277 02/3	21 - 30
SVH 277 02/4	31 - 40
SVH 277 02/5	41 - 124 (one for each Server)

For recommended labeling in BYB 501, see on page 39.

Figure 3.46: Labeling of BYB

501
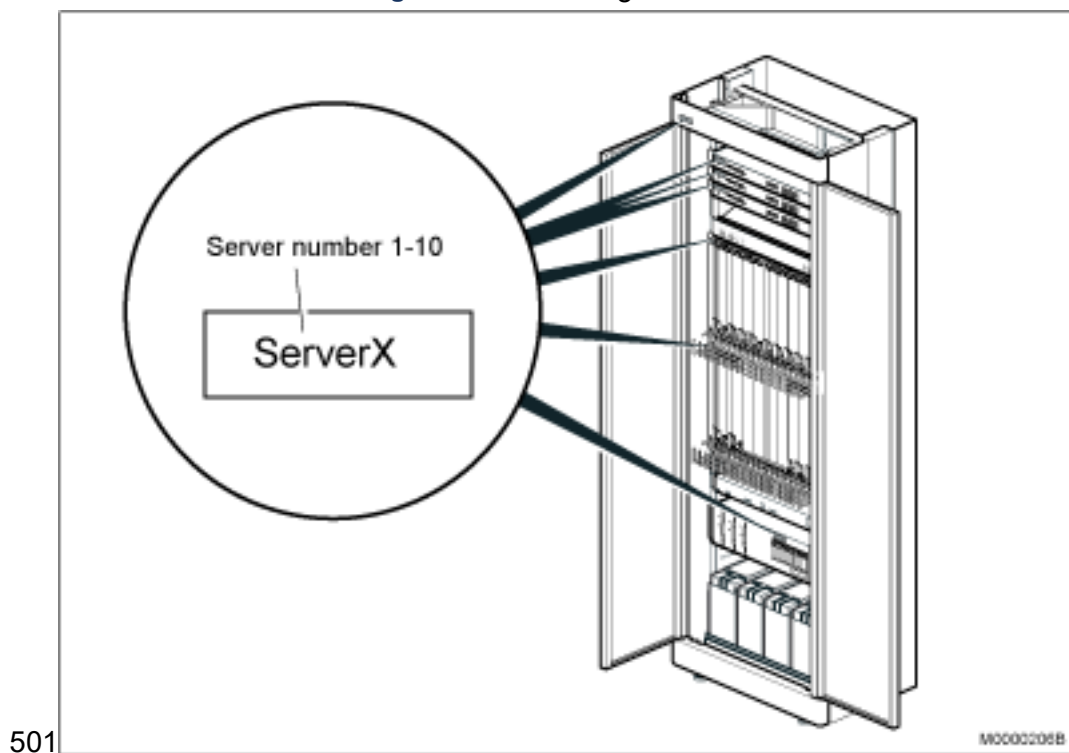
Labeling cables

For labeling of cables see document *21/1531-ASP11301, Installing Boards and Cabling*.

Warning Label, Parallel Connection of Batteries

The warning label, parallel connection of batteries (SVB 131 70) is for indoor use on aluminum, steel, or rigid plastic surface. It is made of self adhesive plastic material and not removable. Fasten three (3) warning labels, one on the right-hand side battery, and two at the bottom of the cabinet, see on page 23 and see on page 40.

Figure 3.47: Warning Label SVB 131

70

WARNING
Multiple power sources.
Parallel connection of batteries.
Before obtaining access to terminals,
all supply circuits shall be disconnected.

SVB 131 70
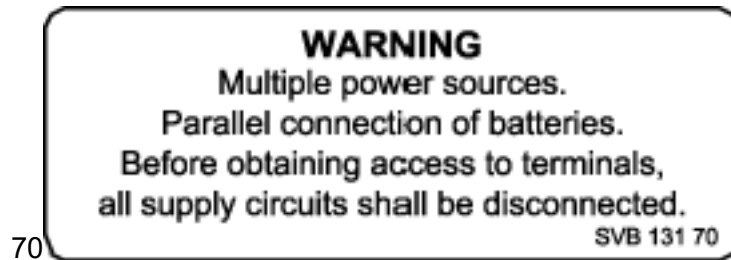
NOTE: Battery warning labels are also available in German and French.

Installing Boards and Cabling

Introduction

MX-ONE is a communication solution for enterprises. MX-ONE integrates voice communication in fixed and mobile networks for public as well as private service. MX-ONE can be integrated into an existing Local Area Network (LAN) infrastructure. MX-ONE supports both IP telephony and functions found in classic circuit-switched PBXes (Private Branch Exchanges).

Scope

This document describes the MX-ONE cabling and connection in a detailed way. It is aimed for customers doing new installation. For other parts of the Installation see:
*   *Installation preparation and Earthing, 19/1531-ASP11301*
*   *Installation Chassis in a Cabinet, 20/1531-ASP11301*

Target Group

The target group for this document is personnel involved in installing the MX-ONE.

Prerequisites

This section lists requirements that must be fulfilled before the installation starts.

Electrical Connections

Installation procedures involving connection of power cables, batteries and earthing must be performed according to local regulations.

Safety

All personnel involved in installation must read and understand the safety instructions prior to installation, see the description document for *SAFETY*.

Installing boards

Device boards can, in the 7U chassis only be placed in the board positions 01-29 and 45-73. Not in positions 33, 37 and 41.

NOTE: It is important to firmly insert the boards, to avoid bending any back plane connectors, or it's contact pins. Press evenly on both sides of the front. Do not use the extractor (available in some boards) to press the board in. Only for the final millimeter of sliding in the board, the extractor is allowed to be used.

To remove any board, use the extractor, or use the tool LTD11702 in an available keyhole in the fronts.

Table 3.24: Boards in MX-ONE (Sheet 1 of 2)

Board	Product number	Building height	Time Slots used	Remarks
ALU2	ROF 137 5373/11	20mm	8	Alarm unit for external alarms
ASU Lite	ROF 137 6307/31	40mm	---	**NOTE:** With the ASU Lite 8GB (J1990 Module) board, a problem occurs with software/hardware addresses for eth0/eth1 on J1990 Module ASU-E ROF 137 6307/31 R2A and ASU-E ROF 137 6307/31 R2B. The cause of the problem is that eth0 address port is at the physical position of the eth1 port and the eth1 address port is at the physical position of the eth0 port. Mitel Server Unit, Lite. 8GB. For more information see item below.
ASU-II	ROF 137 6307/4	40mm	---	Mitel Server Unit. 16GB. For more information see item below.
ASU-III	ROF 137 6307/5	40mm	---	Mitel Server Unit with increased performance and memory (32GB) than ASU-II.
DC/DC	ROF 137 6303/1	40mm	---	Power unit for 7U chassis
ELU26	ROF 137 5321/12	0mm	8	ISDN-S digital extensions
ELU31	ROF 137 5412/4*	20mm	32	DECT extensions

Table 3.24: Boards in MX-ONE (Continued) (Sheet 2 of 2)

Board	Product number	Building height	Time Slots used	Remarks
ELU33	ROF 137 5062/1	20mm	32	Digital extensions
ELU34	ROF 137 5064/x	20mm	32	Analog extensions with message waiting
FTU2	ROF 137 5415/11	20mm	8	Failure Transfer Unit
MFU	ROF 137 5348/X	20mm	8	Multi frequency unit
MGU2	ROF 137 6304/4	20mm	---	Media Gateway Unit. For more information see item below.
TLU76	ROF 137 5338/x*	20mm	32	Digital trunk, ISDN, E1, DPNSS, CAS, SS7
TLU77	ROF 137 5387/x*	20mm	23	ISDN, T1, DPNSS, CAS depending on version
TLU79	ROF 137 5349/11*	20mm	8	ISDN-T 2B+D trunk line
TLU80 (supported board revision R2A)	ROF 137 5406/11	20mm	8	4-wire analog trunk using E&M signaling. This board is used in MX-ONE Classic (7U), MX-ONE Lite (3U) and MX-ONE Slim (1U).
TLU83	ROF 137 6305/1	20mm	8/12	Analog trunk line (loop start, ground start. CLI with FSK and DTMF)
TLU83	ROF 137 6305/2	20mm	8/12	Analog trunk line (loop start, ground start, call metering. CLI with FSK and DTMF)
TMU	ROF 137 5335/x	20mm	32	Tone and Multi part Unit. DTMF

NOTE: Secure all boards with the screws located in the extractor. Use screw driver with Torx T8.

Symptoms (only valid for ASU-Lite)

When installing a MX-ONE 7.1 or later, if only LAN0 is connected, the installation may stop without completing. If only the LAN1 interface is connected, the eth0 will be installed on LAN1. If both LAN0 and LAN1 interfaces are connected, then eth0 will be installed on LAN1 and eth1 on LAN0.

Resolution (only valid for ASU-Lite)

If you want to use only eth0, then connect the network to LAN1. If you want to use switched redundancy, that is, connect both LAN0 and LAN1, be aware that eth0 is at LAN1 and eth1 at LAN0.

To test which eth is configured to which LAN:

1. Log in using as **root** run command: `ethtool -p DEVNAME [TIME-IN-SECONDS]`.
2. Shows visible port identification (for example, blinking).

3. Enter the command `ethtool -p eth0 60`. This will enable blink on the network port LEDs.

4. Connect the cable for eth0 in the correct LAN port (LAN1).

5. Repeat the procedure for eth1.

6. Do not modify the file /etc/udev/rules.d/70-persistent-net.rules to resolve the problem.

ASU-II or ASU-III and ASU Lite

The ASU's has a disk bay for 2 separate SSD units, Solid state drives, (or HDD units (Hard disk drives). They are located behind a cover in the front.

NOTE: SW RAID is supported on ASU-II/ASU-III.

Close to the LED near the LAN-ports, there is a hole for performing reset/ software shout down.

The ASU's has a battery for real time clock. This battery is located just behind the board for the SATA drives connection.

NOTE: Due to the high weight of these boards, handle them with care, and hold the board only in the front. Also, be careful when inserting it into the subrack. Do not force it to avoid any bending of the board.

NOTE: If the ASU-III server is running ESXi 6.7 or later and the board is powered up without monitor connected. The only way to connect the monitor is to reboot the board and the monitor must be connected.

NOTE: If the ASU-III server is running ESXi 6.7 or later and the board is powered up without a monitor connected and a monitor needs to be connected afterwards, this will not work as no VGA signal will be available. VGA signal is only available if the monitor is connected during boot. The only way to connect the monitor in this case is to reboot the board while having the monitor connected.

With normal use and when the network is working properly it should not be necessary to have a monitor connected to the ASU-III as most tasks can be performed via a browser.

MGU2

The MGU2 board has a 20mm front and can be used in any chassis.

Close to the LED there is a hole for performing reset.

For more info see description, *Media Gateway Unit, MGU, 1/1551-ANF90136*.

Empty Board Positions

If any empty positions are left in a chassis after mounting all boards, these empty slots have to be filled with Dummy-fronts to fulfill the EMC demands. See Dummy Front.

Dummy Front

This section describes the dummy front in 19" cabinets.

Dummy fronts are installed at all empty positions in the 19" chassis. New boards can be installed at these positions. Remove the dummy front at the position were the new board is to be installed and insert the new board.

NOTE: All empty board positions must be covered with dummy fronts to fulfill the EMC requirement and to be compliant with the BYB501 cooling requirements (air flow).

Figure 3.48: 20mm Dummy Front
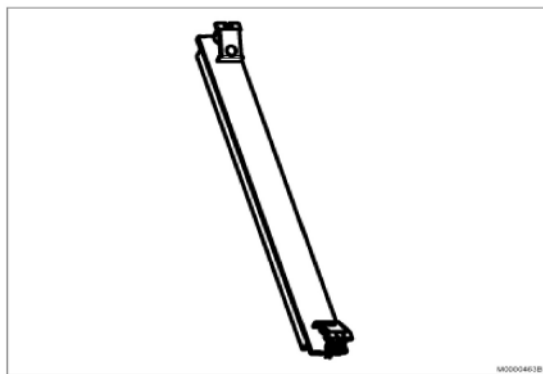
Table 3.25: Dummy Front

Function	Product Number	
Front 20 mm	SXK 106 1020/35	

Connectors and LEDs on Board Fronts

This section describes the connectors and LEDs on the boards.

The indication of board status with dual color LED is:

- Steady RED: The board is in passive state
- Flashing RED: Error state
- Alternating RED/GREEN: The board is starting up or is blocked.
- Steady GREEN: The board is active.
- Flashing GREEN: The board is active and is signaling.

NOTE: DC/DC-, MGU-, TLU77- and ASU-boards deviate from above. See the figures below regarding how they differ.

Figure 3.49: TLU77, TMU, TLU76, ELU33, and ELU34 Board
Fronts
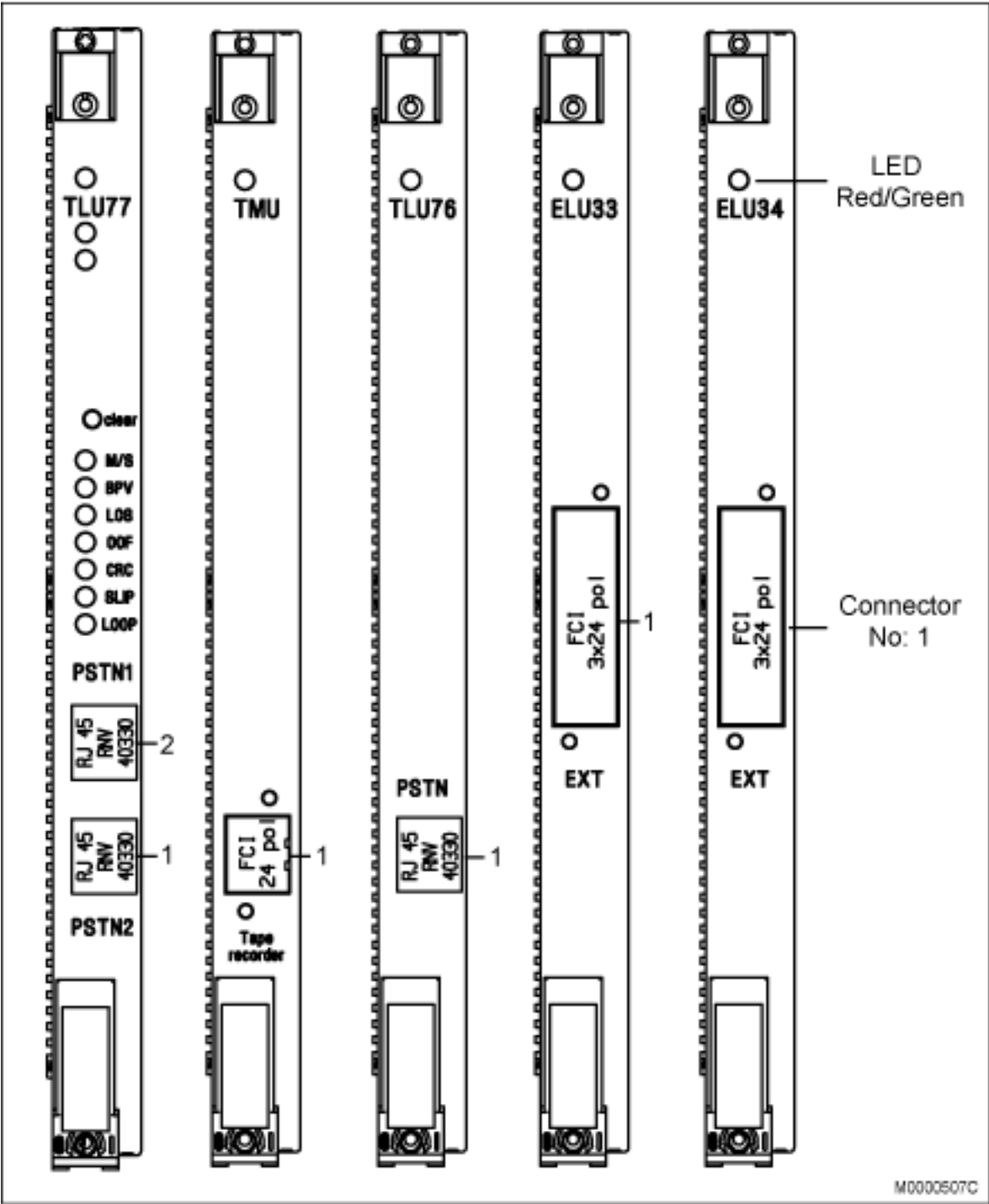
Figure 3.50: ASU Front
Connectors
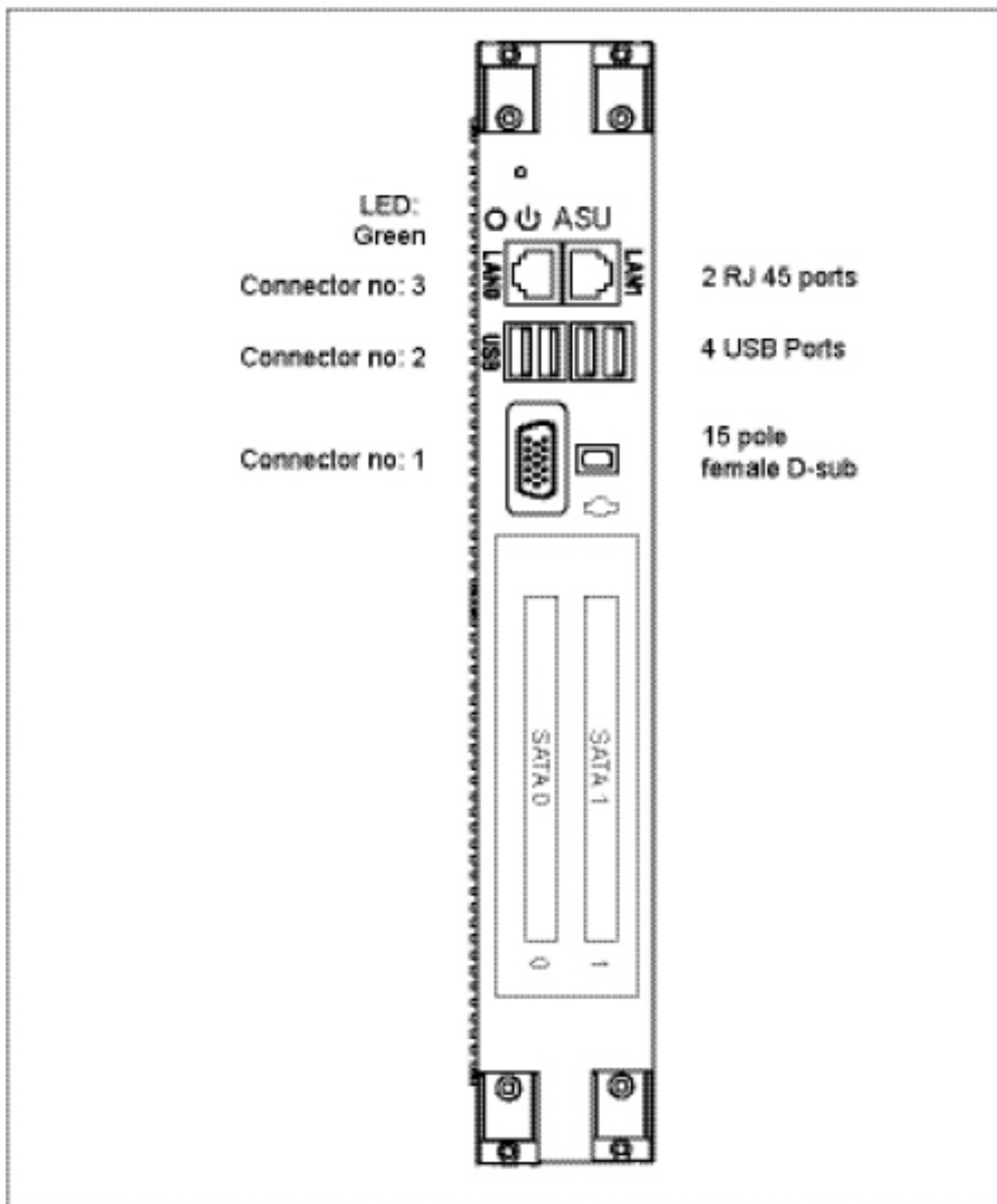
The SATA disks are located behind a cover. Two disks are used for RAID 1.

Figure 3.51: DC/DC Front Connectors and LEDs

M0000328A
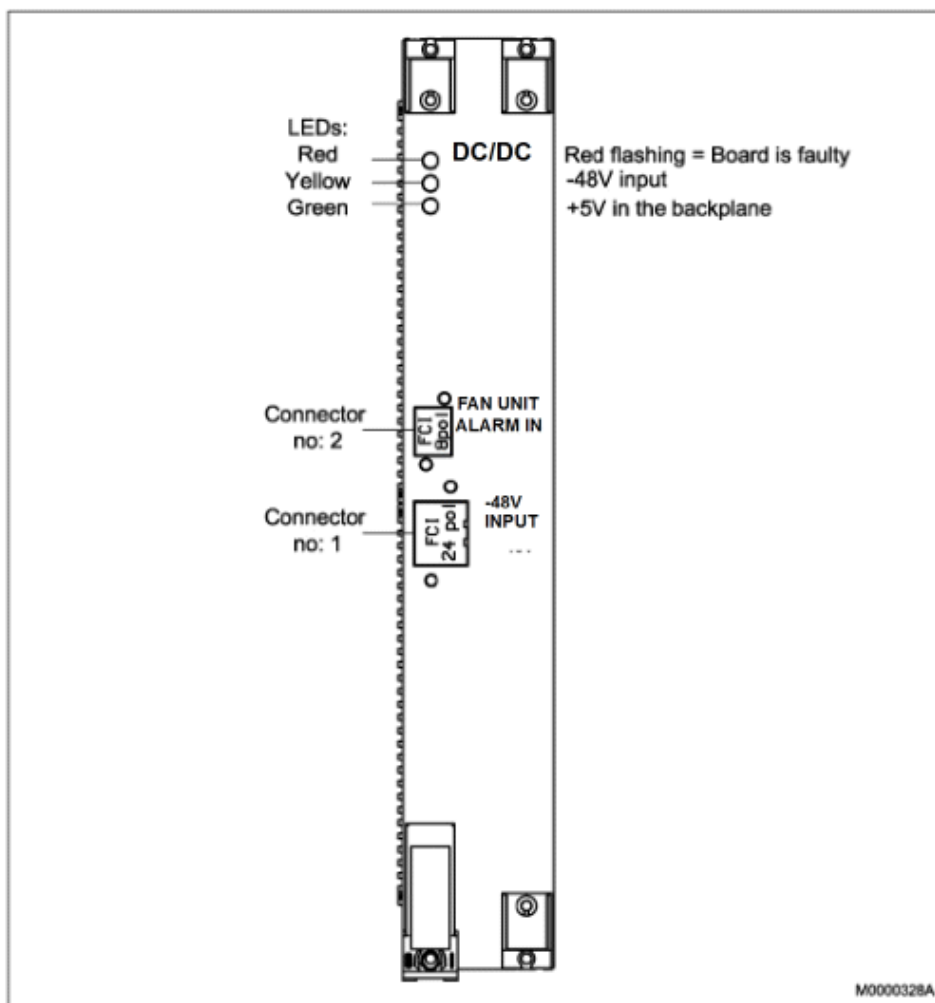
Figure 3.52: ALU2, ELU31, TLU79, TLU80 and TLU83
Fronts
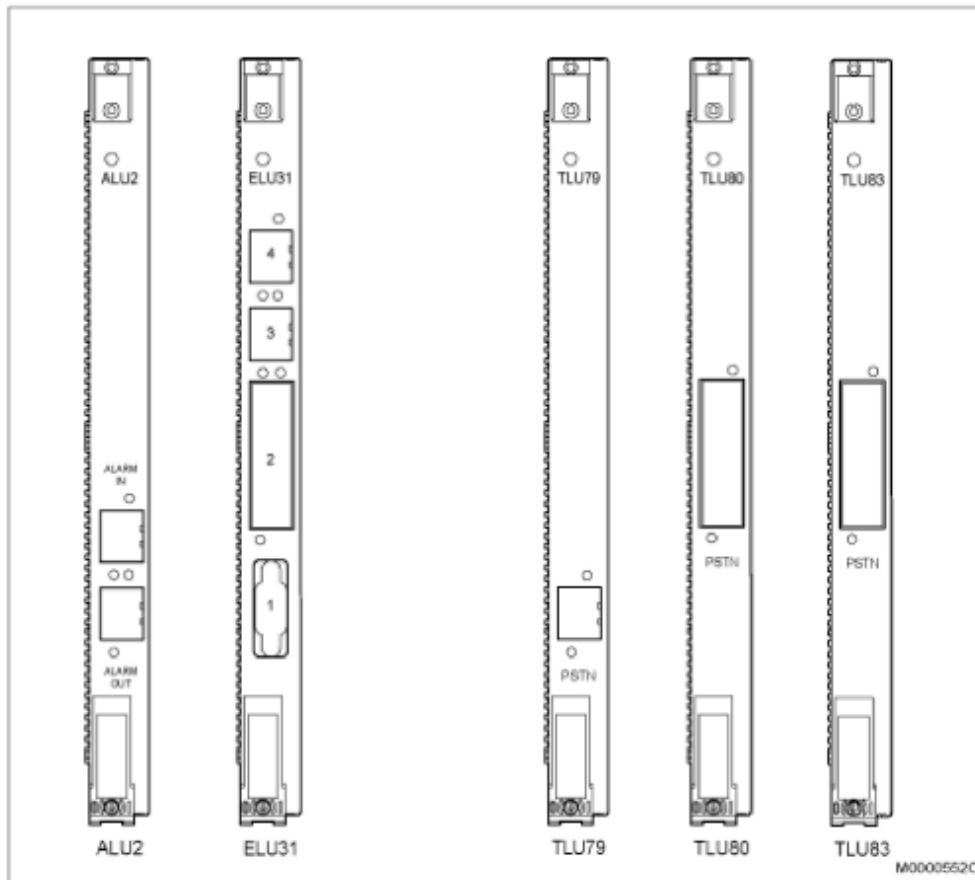
NOTE: ELU26 and TLU79 has equal fronts, only different printing.

Figure 3.53: TLU77 Front Connectors and
LEDs

Red	○	In red alarm state
	TLU77	
Yellow	○	Receiving yellow alarm
Green	○	Receiving AIS (un-framed all ones)
	○ clear	Clear (BPV , LOS , OOF , CRC and SLIP)
Green	○ M/S	M/S , sync. receiver master/slave
Red	○ BPV	BPV , bipolar violation
Red	○ LOS	LOS , loss of signal
Red	○ OOF	OOF , out of frame (2 out of 4)
Red	○ CRC	CRC , CRC-6 error
Red	○ SLIP	SLIP
Yellow	○ LOOP	LOOP , device under loop test

PSTN1

RJ 45 RNV 40330

RJ 45 RNV 40330

PSTN2

Figure 3.54: MGU2 with 20mm
front
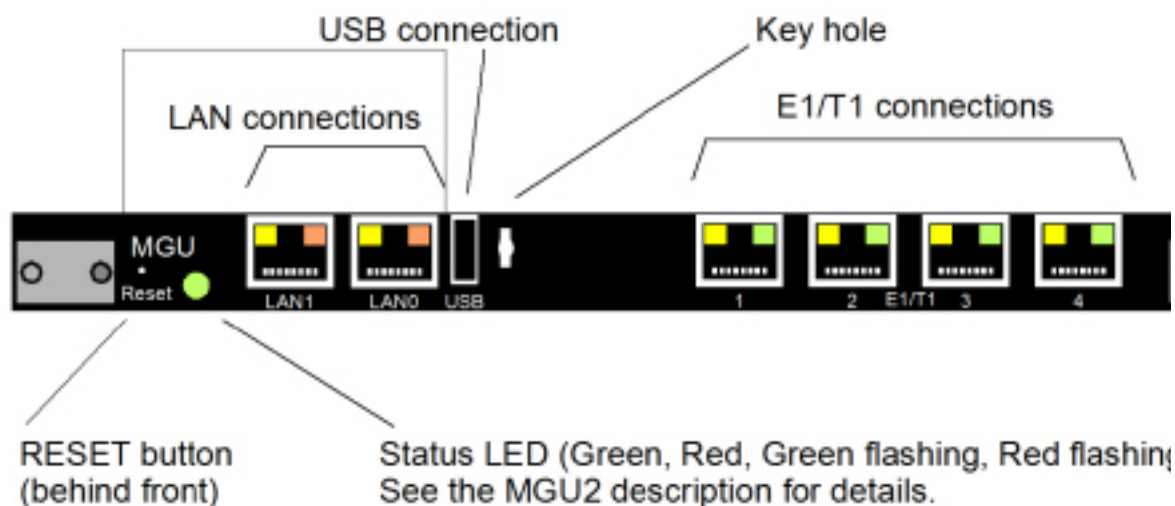
Cabling

Cabling involves both internal and external connections on site.

External cabling is the routing of cables for grounding, to power equipment and other external devices. Internal cabling is the routing of cables within a cabinet or between cabinets.

Use the fastener straps (cable tie) provided in material set 25/BYB 501/1 to fasten the cables to the rack, cable chutes, rear sides of chassis and so on. See Table Set of Cable holders (Cable tie).

Table 3.26: Cables in MX-ONE (Sheet 1 of 3)

Unit	Cable Product Number	Remarks
ALU2	TSR 491 0306/20M	to MDF
ASU-III, ASU-II and ASU Lite	61L00002AAA-A	to LAN 1GBit, RJ45-RJ45, straight. L=2,4 meters
	TSR 482 0211/2400	to LAN, 100Mbit, RJ45-RJ45, straight. L=2,4 meters
	TRS 899 135/1	USB to V.24 adapter cable
Battery, std	61L00006CAA-A	to AC/DC. (included in cable kit 51305284)
Battery	TFL281325/4000	Between batteries for parallel connection

Table 3.26: Cables in MX-ONE (Continued) (Sheet 2 of 3)

Unit	Cable Product Number	Remarks
DC/DC-board (7U) 51305286 51305287 5 meter splitter cable to both 7U AND Fan 12 meter splitter cable to both 7U AND Fan	5 meters long to AC/DC, 48V	
	12 meters long to AC/DC, 48V	
		50006938
		50006937
TSR 491 414/32M	to MDF	ELU26
TSR 910 1054/16M, 32M	to MDF	ELU31, ELU33, ELU34
TSR 901 1226/3000, /5000, /15M	Sync-ring	ELU31
TSR 910 1059/32M	to MDF	FTU2
TSR 491 0306/20M	to MDF	MFU/11
TSR 482 0211/2400, /20M	to LAN 100Mbit or E1/T1 to E1/T1	MGU2
TSR 899 135/1	USB to V.24 adapter cable	
TSR 482 0240/7000	for E1/T1 crossover	
61L00002AAA-A	to LAN 1GBit, RJ45-RJ45, straight. L=2,4 meters	
TSR 482 0211/2400, /20M	to MDF	TLU76
TSR 482 0211/2400, /20M	to MDF	TLU77
TSR 491 414/32M	to MDF	TLU79
TSR 910 1054/16M, /32M	to MDF	TLU80
TSR 910 1054/16M, /32M	to MDF	TLU83
TSR 491 0306/20M	to MDF	TMU/12
51305285	2 meters to AC/DC, 48V	MX-ONE Lite 3U chassis, 87L00039BAA-A
61L00007AAA-A	for Alarm connection	
51305285	2 meters to AC/DC, 48V	MX-ONE 1U chassis, 87L00032BAA-A
TSR 482 0211/20M	LAN, 100MBit. RJ45 - RJ45, straight. L=20 meters	Network
61L00002BAA-A	LAN, 1GBit, RJ45 - RJ45, straight. L= 20 meters	

Table 3.26: Cables in MX-ONE (Continued) (Sheet 3 of 3)

Unit	Cable Product Number	Remarks
51305286	5 meters long, -48V	Power to Fan *) and to 7U chassis
51305287	12 meters long, -48V	
50006938	5 meter splitter cable to both 7U AND Fan, -48V	
50006937	12 meter splitter cable to 7U AND Fan, -48V	
TSR 902 0274/2200 TSR 902 0277/2000 SXK 106 2097/1	Alarm cables and plug	Fan *) to alarm
50006936	Splitter 1 to 2. Used when 5 to 8 pcs of 1U/3U chassis are fed from the same power Unit.	Splitter cable for 1U and 3U chassis

*) Fan BFD50908/4

NOTE: Consider the needed cabling for network or server redundancy. For more information, see the description for *MIVOICE MX-ONE*, chapter *REDUNDANCY*.

Connector Positions

Only boards with EMC shielded fronts are used in the MX-ONE subracks.

Connector Numbering

The connector positions are marked in numerical order starting from 1 for the lowest connector position, 2 for the position above it and so on.
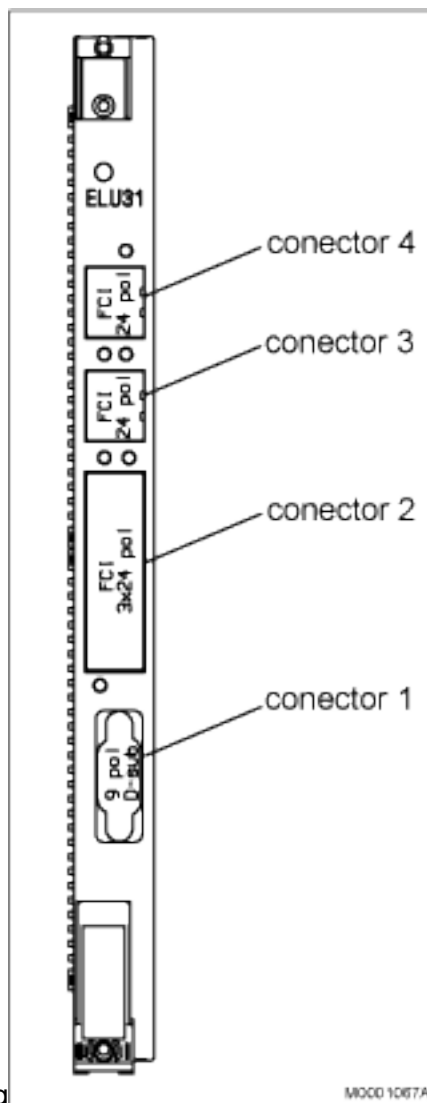
Figure 3.55: Connectors positioning

Cable Labeling

Product Labeling

Cables have different types of product marking. See Table Cables in MX-ONE for a complete list of available cables.

Label Sets

Every MX-ONE Service Node has a label set with labels that are used to mark the cables in the MX-ONE.

Product Number	Server Number	Product Number	Server Number
SVH 277 030/1	1	SVH 277 030/5	6-10
SVH 277 030/2	2	SVH 277 030/6	11-20
SVH 277 030/3	3	SVH 277 030/7	21-40

SVH 277 030/4	4-5	SVH 277 030/8	> 40 (one for each Server)

Labeling of Cables

Cables are marked with labels in both ends. The labels contain the following information:

- Cable source
- Cable destination
- Server number
- Cable number
- Position (in boards or other devices) for cable connection

For a general explanation of the information in cable labels.

Figure 3.56: Labeling
Cables
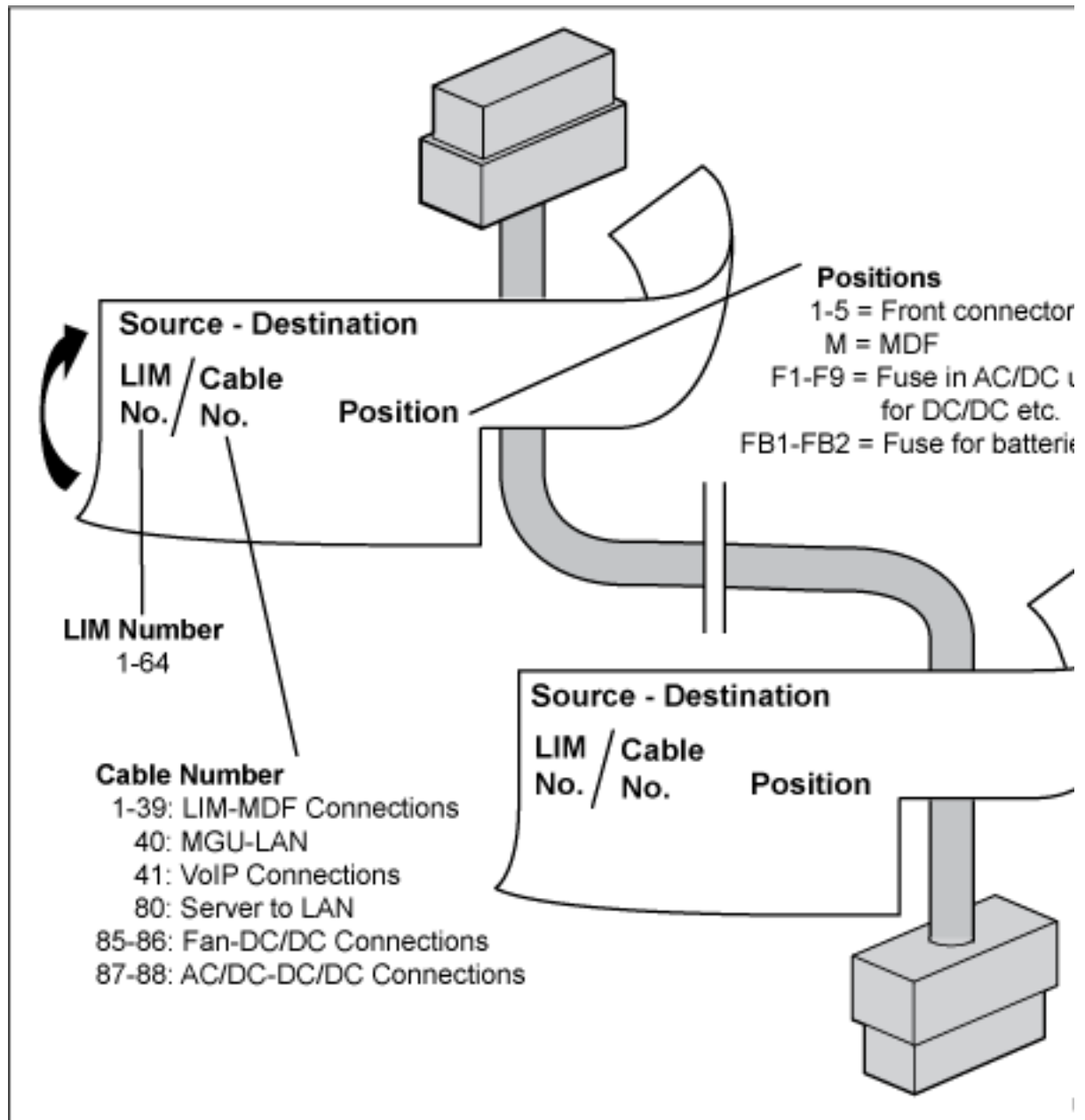
Labeling of Internal Cables

The internal cables connected to fixed positions in the exchange are already labeled at delivery. The label indicates the position of the cable's own connector as well as that of the other end.

For example: GW1/81 (0*21*4) means that for Gateway 1, cable 81 is to be placed on the left side of MGU (0= left, 1= right), board position 21 (01, 05, 09,..., 77), and at connector 4, counted from the bottom.

Figure 3.57: Labeling of
cables

GW1/81 (0 * 21 *4)

Example:

Connector position, numbered from bottom

Position in subrack
Values = 01,05,09...-77.

0 = left side of the subrack, 1 = right side
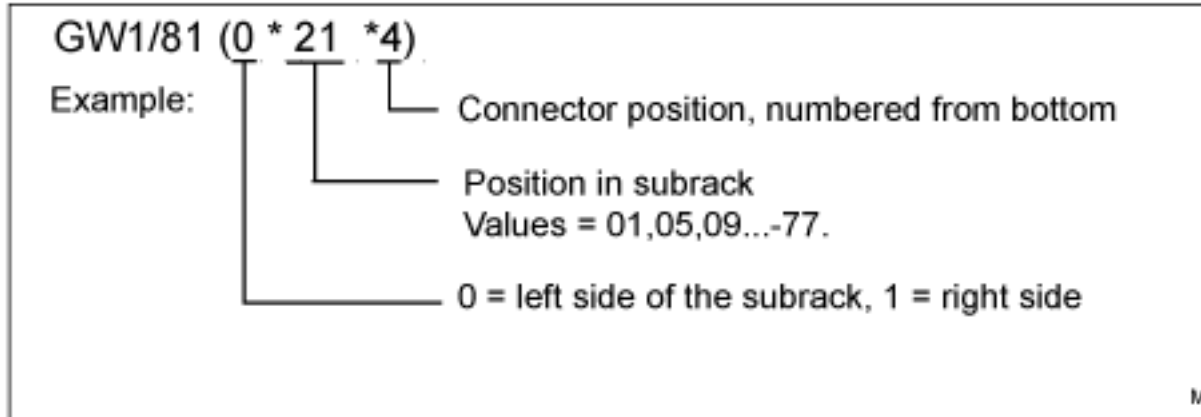
Connecting Internal Power Cables

For instructions on how to connect mains cable to the AC/DC unit, refer to manufacturer instructions supplied with the unit.

Refer to local regulations when working with electric power.

Connecting the Batteries to the AC/DC Unit

Work involving batteries must be carried out by personnel with appropriate technical training and experience necessary to be aware of hazards to which they can be exposed.

The battery fuse/circuit breaker is located in the power supply unit. It means that the conductor connected to the negative pole of the battery and to the battery fuse/circuit breaker is an unfused battery conductor.

It is extremely hazardous to work with unfused battery conductors.

NOTE: Before battery conductors are; connected, disconnected or installed, remove the conductor to the negative pole (A) or remove an interconnection bridge (B)

Figure 3.58: Example of Removing the Negative Battery Conductor (A) and an
Interconnecting Bridge

(B)
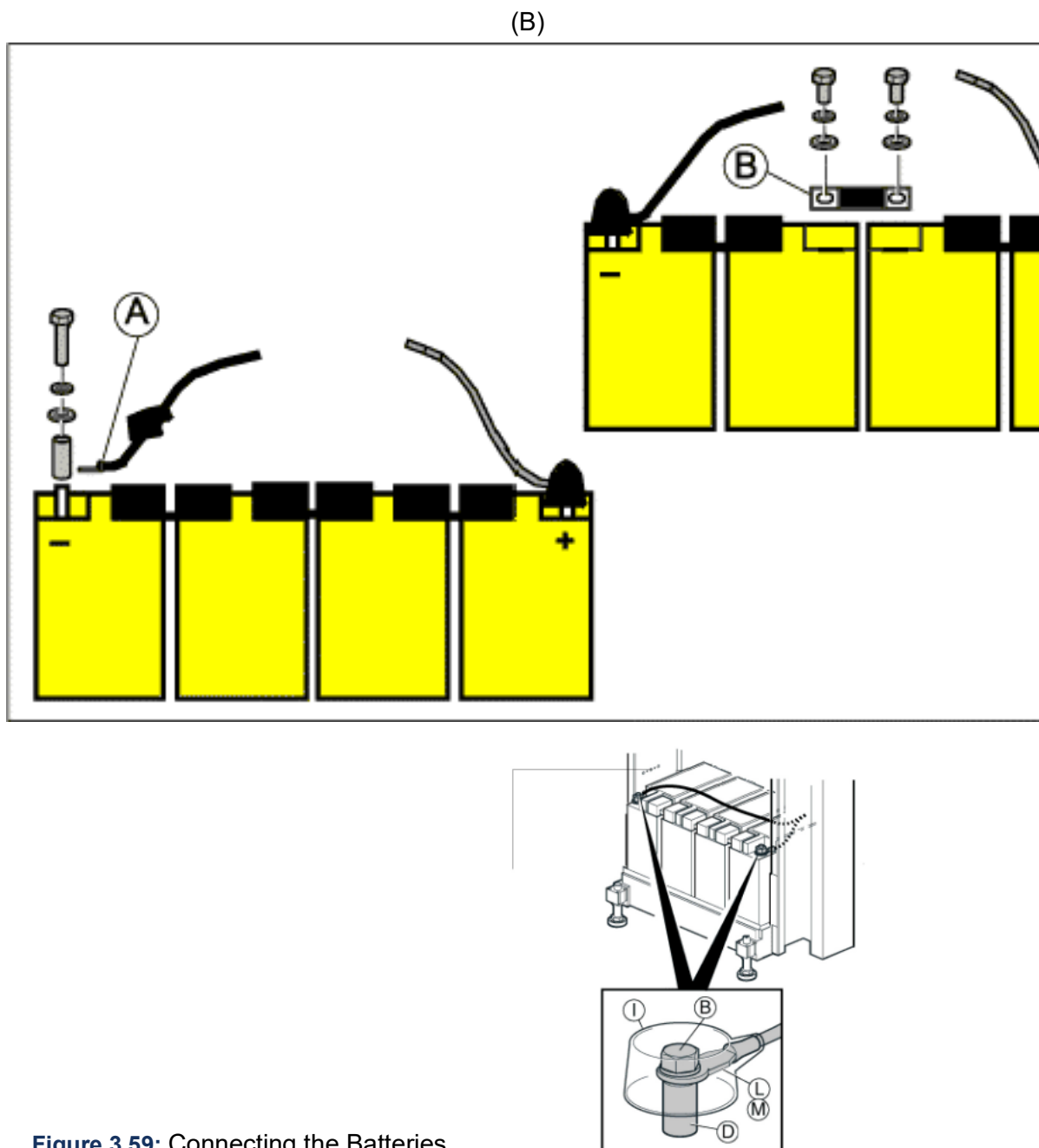
Figure 3.59: Connecting the Batteries

General battery connection:

1. Connect the cable lug (L) of the grey cable to the red plus pole (D) of the right-most battery block.

2. Fasten the screw (B) to secure the cable lug and press down the cover (I) on the red plus pole (D).

3. Connect the cable lug (M) of the black cable to the minus pole (D) of the leftmost battery block.

4. Fasten the screw (B) to secure the cable lug and press down the cover (I) on the black minus pole (D).

5. Connect the other end of the cable (blue connector) to the Power Unit. It is positioned at the rear side of the unit.

Connecting the AC/DC Unit to MX-ONE

See suppliers documentation for correct connection to the AC/DC.

When connecting cables in the AC/DC unit, always fasten nearby cables to each others and to any cable cloth or frame using fastener straps included in the 25/BYB 501/1. This to relieve the force on the connections.

Table 3.27: Set of Cable holders (Cable tie)

25/BYB 501/1 Set for cables		
Title/Function	**Product Number**	**Quantity**
HOLDER FOR STRAP	SXA 123 0411/2	40
CABLE CLAMP (STRAP)	SET 103 02	40

NOTE: Do not cut the cables. The shortest length of the cables from the AC/DC unit to the DC/DC board must be 5 meters.

Connecting to the Mitel 48V Power Cables for ABB PSU

Table 3.28: Mitel 48V Power Cables for ABB PSU

Mitel 48V Power Cables for ABB PSU		
Power Cables	**Mitel P/N**	**ABB Description**
2 m cable for 1U and 3U chassis	TSR9020279/2000	Power cable 48V 2m (Max Amper? (2x0,75mm, 4 pole connector on 1U and 3U chassis)
5 m cable for 7U chassis or Fan Unit	TSR903021/5000	Power cable 48V 5m
12 m cable for 7U chassis or Fan Unit	TSR903021/12M	Power cable 48V 12m
Splitter cable 7U DC/DC and Fan, 5 m	-	MiV MX-ONE48V7U&FanPwercble 5m (Similar to 50006937)
Splitter cable 7U DC/DC and Fan, 12 m	-	MiV MX-ONE48V7U&FanPwercble12m (Similar to 50006938)
Splitter for 1U/3U units, 20cm	-	MiV MX-ONE48VSplitterCable1to2 (Similar to 50006936)

NOTE: Do not cut the cables. The shortest length of the cables from the AC/DC unit to the DC/DC board must be 5 meters.

Connecting AC/DC-Unit 51305282 to Mains

The Power Unit have IEC connector on the rear side. Connect the mains cables and secure them to avoid power breakdown.

Connecting AC/DC to the LAN

The Power Unit 51305282 can be equipped with a communication module, the PCC Unit, 5130283. This unit communicate via the LAN. For details about functionality and configuration, see suppliers data sheet/manual.

Connecting Power (-48V) to Fan Unit BFD50908/4

Two types of cables can be used to Power the Fan Unit. Single cables or Splitter cables.
- **Single Cables:** Connect the Power to the fan unit using cable 51305286, 5 meter long or 51305287, 12 meters long, see item (1) in Fig. see Figure Single cables to the Fan Unit BFD50908/4 and to 7U chassis.
- **Splitter cables:** Connect the Power to the fan unit using cable 50006938, 5 meter long or 50006937, 12 meters long, see item (1) in Fig. see Figure Splitter Cable to the Fan Unit BFD50908/4 and to 7U chassis.

NOTE: If Alarm handling is required, cables marked with *) are also needed. For alarm cables and plugs, see MiVoice MX-ONE Classic with Power Unit.

NOTE: If only one Power cable is connected to the Fan Unit, the alarm on the Fan will be activated. This is not possible to re-configure. To avoid the alarm in the Fan, feed the Fan unit with 2pcs of Power cables or use the Splitter cables.

Figure 3.60: Single cables to the Fan Unit BFD50908/4 and to 7U chassis
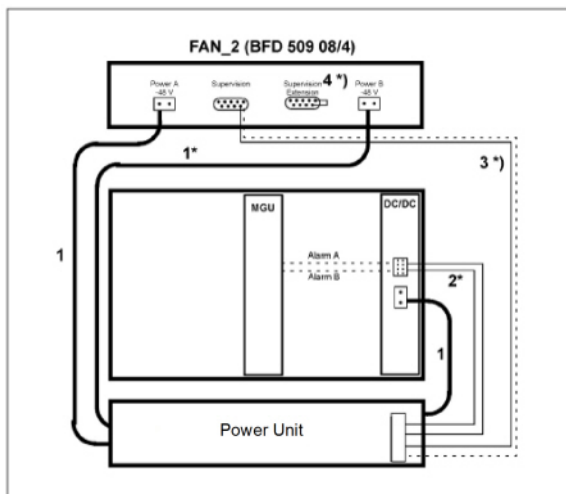
Figure 3.61: Splitter Cable to the Fan Unit BFD50908/4 and to 7U
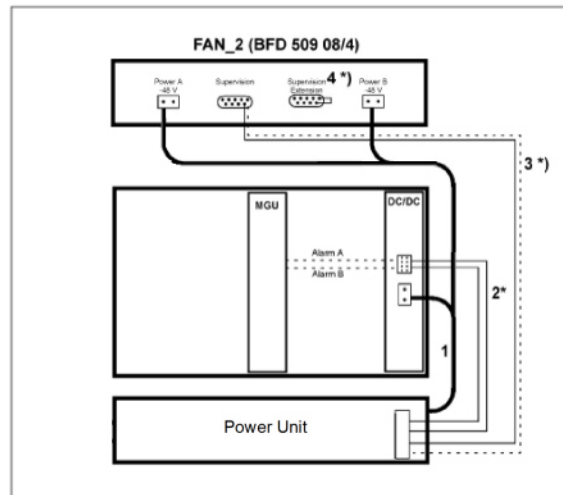
chassis

Connecting Power to 1U Chassis 87L00032BAA-A

Connect the -48V DC power to the 1U chassis using cable 51305285. The connector on the 1U chassis is located on the rear side of the chassis.

The 1U chassis can be fed also with mains power 100-240VAC. This connector is also located on the rear side.

NOTE: If more that 4 pcs of 1U chassis and/or 3U chassis are feed with -48V in one system, the power ports in the Power unit are not enough (4 ports). Then a splitter cable can be used to feed 2pcs of 1U/3U chassis per power port. This splitter cable is 50006936.

NOTE: only 2 chassis can be feed from one port in the Power Unit.

Connecting Power to 3U Chassis 87L00039BAA-A

Connect the -48V DC power to the 3U chassis using cable 51305285. The connector on the 3U chassis is located on the rear side of the chassis.

The 3U chassis can be fed also with mains power 100-240VAC. This connector is located on the rear side.

NOTE: If more that 4 pcs of 3U chassis and/or 1U chassis are feed with -48V in one system, the power ports in the Power unit are not enough (4 ports). Then a splitter cable can be used to feed 2pcs of 1U/3U chassis per power port. This splitter cable is 50006936.

NOTE: only 2 chassis can be feed from one port in the Power Unit.

Connecting Power (-48V) to 7U Chassis BFD76140

Two types of cables can be used to Power the 7U chassis. Single cables or Splitter cables.
- **Single Cables:** Connect the -48V power to the DC/DC-board using cable 51305286, 5 meter long or 51305287, 12 meters long, see item (1) in Fig. see Figure, Single cables to the Fan Unit BFD50908/4 and to 7U chassis.
- **Splitter cables:** Connect the -48V power to the DC/DC-board unit using cable 50006938, 5 meter long or 50006937, 12 meters long, see item (1) in Fig. and continue with the remaining of the cable to the Fan unit. see Figure: Splitter Cable to the Fan Unit BFD50908/4 and to 7U chassis.

Connecting Cables

Some cables are pre-connected at delivery, depending on equipment configuration ordered.

Use the figure and the table below to connect cables, or to verify that the cables are correctly connected. For cable connections to board positions

Always verify that the cable markings correspond before connecting cables.

For a list of cables, including source and destination for every cable

Do not cut extension cables shorter than 3.5 m. This might disturb the function in the system.

Figure 3.62: Cable Connections Configure Example
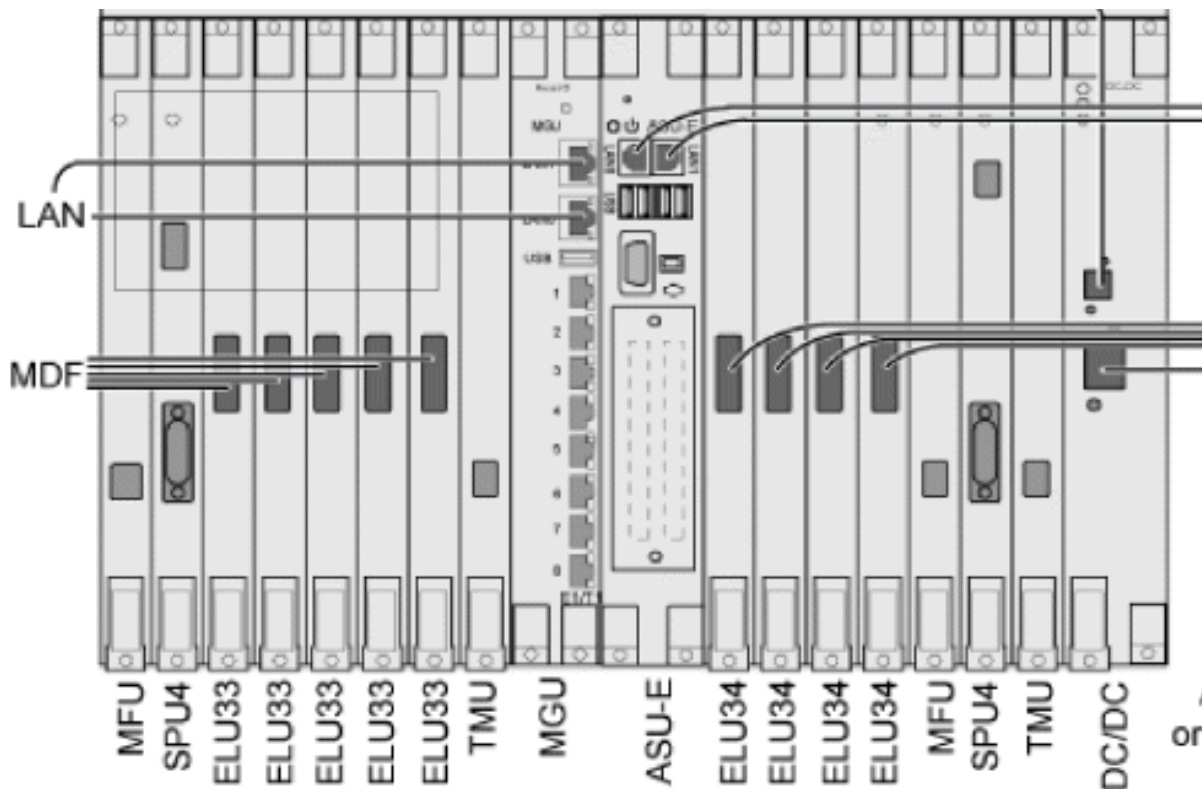
Figure 3.63: MX-ONE Lite cabling
example
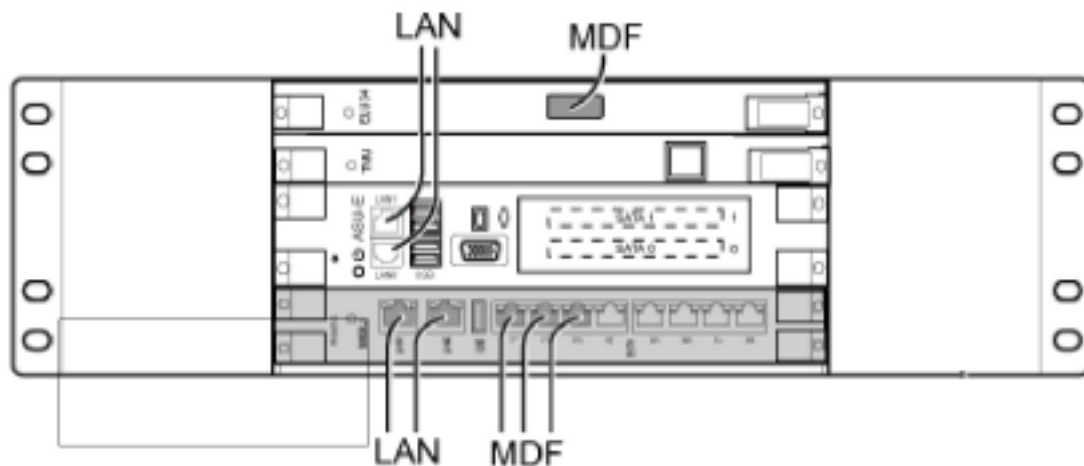
The MGU is connected to a server via the corporate LAN (i.e. a Switch). This is also valid when multiple gateways are connected to a server.

Extension and Trunk Line Cable Structure

The twisted pair cable used for Extension and trunk lines in the MX-ONE is delivered with 32 pairs. The cable is structured either with 8 pairs in 4 bundles, 2 blue and 2 orange bundles, or, with 16 pairs in 2 bundles, 1 blue and 1 orange. Each bundle is kept together with a bundle thread.

Figure 3.64: Cable
Structure
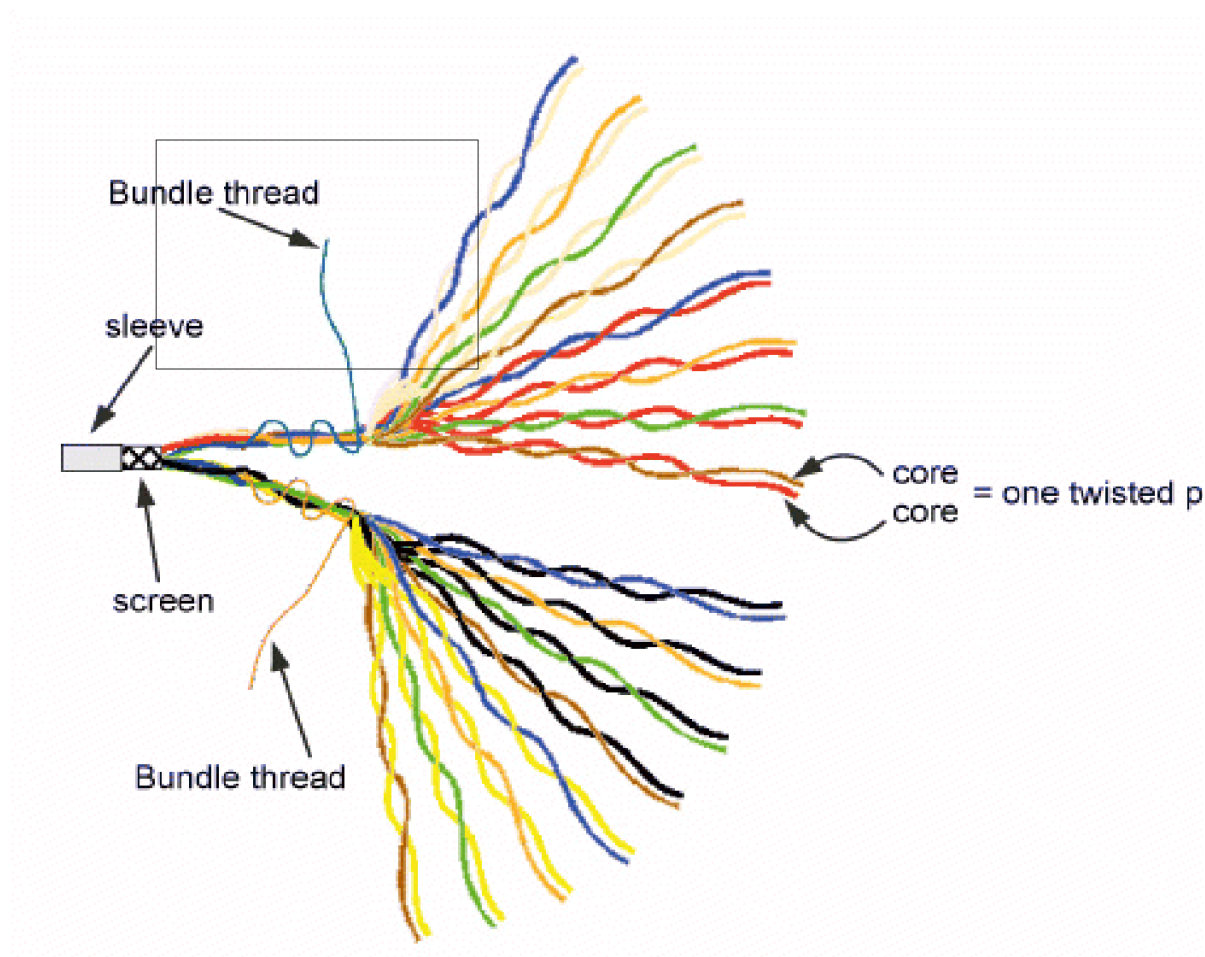
The cables connected to the extension and trunk boards are connected on the other end to external tele-phone lines through the Main Distribution Frames (MDF). The following tables specify the color coding of the 32 pair cable used for ELU33, ELU34, and other boards, and the connection cable used for TLU76 , TLU77 and ELU26, TLU79.

Use the tables below to connect extension and trunk cables to the MDF. Note, that the screen also shall be grounded on the MDF-side, due to the demand of Multi point earthing. See document 19/1531-ASP11301.

Figure 3.65: 32 pair cable for ELU33, ELU34, ELU31, TLU80 and TLU83 (TSR 910 1054/16M or

32M)
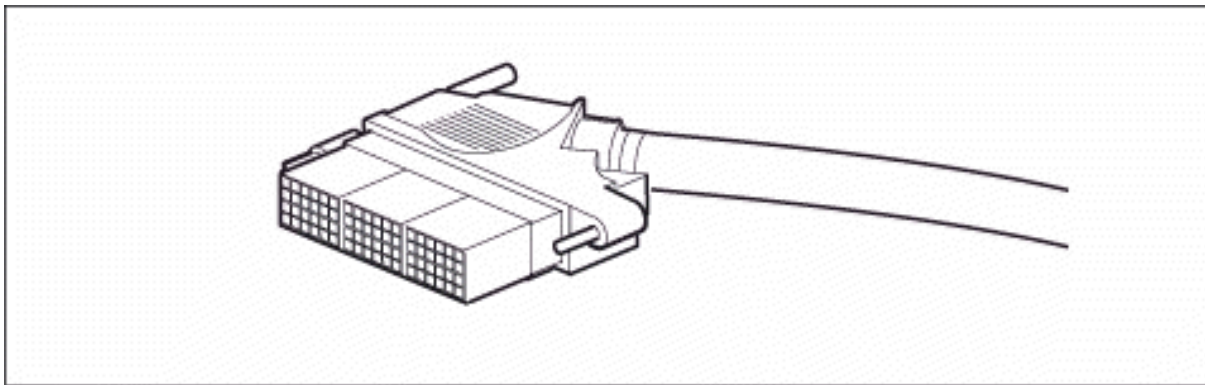
ELU33, ELU34, ELU31/4 and TLU80 Cable Structure

Figure 3.66: Front view
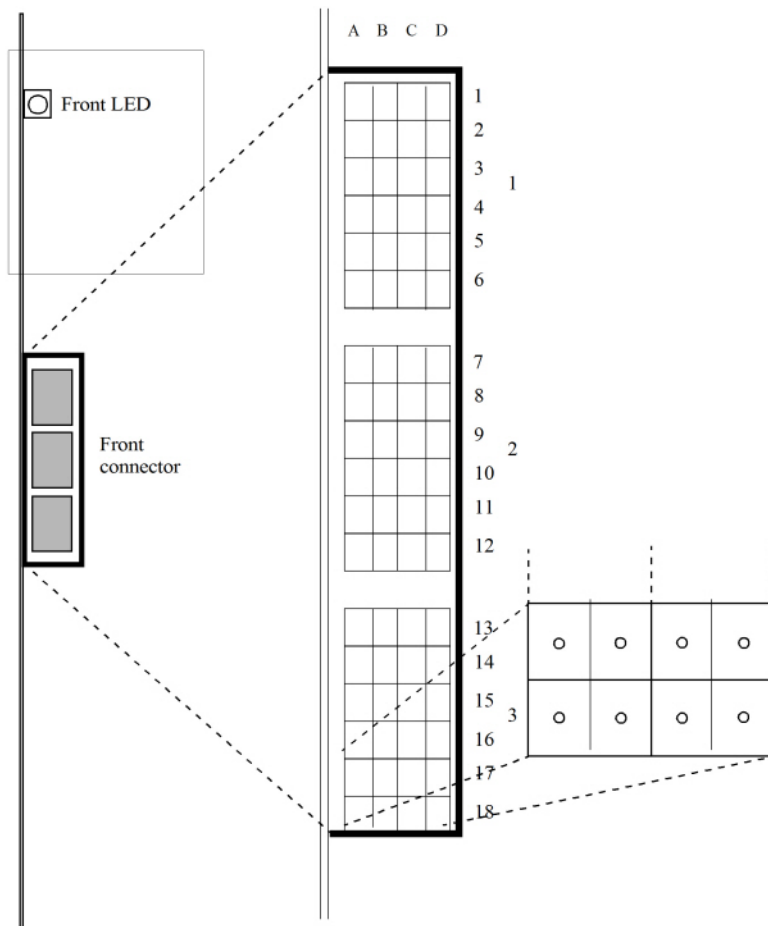
NOTE: ELU34 has to have individual 0 activated as the first individual and removed as the last individual, or else the communications with the board will fail.

Table 3.29: Color Coding in 32 Pair Cable for ELU33, ELU34 and ELU31

Pair	Core	Color	Bundle	Connector		Pair	Core	Color	Bundle	Connector
1	a	White		D18		21	a	White		D9
	b	Blue		C18			b	Blue		C9
2	a	White		A17		22	a	White		A8
	b	Orange		B17			b	Orange		B8
3	a	White		D17		23	a	White		

TLU83 Cable Structure

The TLU83 board uses the same type of 32 pair cable but it is organized differently. TLU83 uses 12 pairs for its 12 trunk line individuals, called TL Ind in the table below. Core **a** is used for Tip and core **b** is used for Ring in each pair. The three upper rows go to 0 V, marked GND. Connectors in rows 7 to 14 are used. The remaining 14 wire pairs are not connected and marked NC.

Table 3.30: Color Coding in 32 Pair Cable for TLU83 (TSR 910 1054/16M or 32M)

Pair/TL Ind	Core	Color	Bundle	Connector		Pair/TL Ind	Core	Color	Bundle	Connector
1/ NC	a	White		D18		21/ 8	a	White		D9
	b	Blue		C18			b	Blue		C9
2/ NC	a	White		A17		22/ 9	a	White		A8
	b	Orange		B17			b	Orange		B8
3/ NC	a	White		D17						

TLU76 and TLU77 Cable Structure

Figure 3.67: Connection Cable for TLU76, TLU77 (TSR 482 0211/xxx)
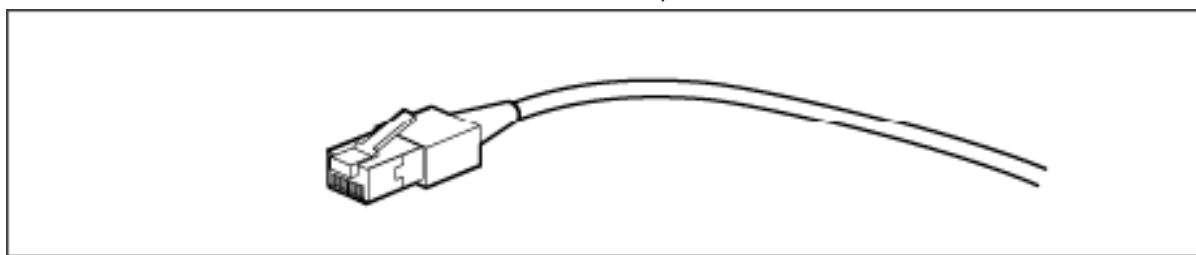
Table 3.31: Color Coding in Cable for TLU76, TLU77 (TSR 482 0211/xxx)

Pair	Core	Color	Pinn No.	Description
1	A	Blue/White	5	Tx+
	B	Blue	4	Tx-
2	A	Orange/White	1	Rx+
	B	Orange	2	Rx-
3	A	Green/White	3	Shield
	B	Green	6	Shield
4	A	Brown/White	7	NC
	B	Brown	8	NC

ELU26 and TLU79 Cable Structure

Table 3.32: Color Coding in Cable for ELU26 and TLU79 (TSR 491 414) (Sheet 1 of 2)

Pair	Core	Color	Connector	Description
1	A	White	C6	Individual 0
	B	Blue	D6	TX+, TX-
2	A	White	A6	Individual 1
	B	Orange	B6	TX+, TX-
3	A	White	C5	Individual 0
	B	Green	D5	RX+, RX-
4	A	White	A5	Individual 1
	B	Brown	B5	RX+, RX-

Table 3.32: Color Coding in Cable for ELU26 and TLU79 (TSR 491 414) (Continued) (Sheet 2 of 2)

Pair	Core	Color	Connector	Description
6	A	Red	C4	Individual 2
	B	Blue	D4	TX+, TX-
7	A	Red	A4	Individual 3
	B	Orange	B4	TX+, TX-
8	A	Red	D3	Individual 2
	B	Green	C3	RX+, RX-
9	A	Red	B3	Individual 3
	B	Brown	A3	RX+, RX-

MGU and MGU2 Cable Structure

Table 3.33: Color Coding in Cable for MGU E1/T1 connection (TSR 482 0211/xxx)

Pair	Core	Color	Pinn No.	Description
1	A	Blue/White	5	Tx+
	B	Blue	4	Tx-
2	A	Orange/White	1	Rx+
	B	Orange	2	Rx-
3	A	Green/White	3	Shield
	B	Green	6	Shield
4	A	Brown/White	7	NC
	B	Brown	8	NC

Connection of External Cables

Cabling to the MDF uses prefabricated cables.

Twisted, shielded, pair-cables are to be used for cabling between the PBX and MDF or PBX and PBX (Media Gateway - Media Gateway).

The cable length from the exchange to the MDF shall not be shorter than 3 meters (118 inches).

Line Lengths

ELU26

The following three connection alternatives are based on the usage of a 75 ohm twisted pair cable, 120 nF/km and wire 0.6 mm or a 150 ohm twisted pair cable, 30 nF/km and wire 0.6 mm or 125 ohm/km DC.

- 1000 m, point-to-point with one terminal.
- 500 m, extended passive bus with 8 terminals.
- 100 m, short passive bus with 8 terminals.

ELU31

For information see Installation Instructions for CORDLESS PHONES.

ELU33

600 m if using a twisted pair cable with wire diameter 0.4 mm.

1000 m if using a twisted pair cable with wire diameter 0.5 mm, point-to-point with one terminal.

ELU34

6000 m if using a twisted pair cable with wire diameter 0.4 mm.

9000 m if using a twisted pair cable with wire diameter 0.5 mm.

TLU76

260 m if using a 120 ohm twisted pair cable without repeater

TLU77

260 m if using a 120 ohm twisted pair cable without repeater

TLU79

see Figure Connecting TLU79 to TLU79 through MDF (8 pairs).

TLU80

7000 m if using a twisted pair cable with wire diameter 0.4 mm. 11000 m if using a twisted pair cable with wire diameter 0.5 mm.

TLU83

5000 m if using a twisted pair cable with wire diameter 0.4 mm.

8000 m if using a twisted pair cable with wire diameter 0.5 mm.

Analog Extensions ELU34

ELU34 is a 32 individuals analog extension line unit intended for normal analog telephones, with functionality for both message waiting and call metering. A parallel telephone, an extra bell or a FAX can be connected to an ELU34.

NOTE: ELU34 has to have individual 0 activated as the first individual and removed as the last individual, or else the communications with the board will fail.

NOTE: If done in the wrong order individuals will be blocked.

NOTE: An external primary protection circuit shall be used as an additional protection when outdoor lines from other buildings are connected to the board. This protection circuit must have a striking voltage higher than 280 VDC.

NOTE: A remaining high voltage may remain on the board when the board is removed from the subrack with the power still on, a so called "hotswap". Do not touch the board component or solder points for a few minutes after the removal. To reduce the high voltage to a safe level, leave the board un-plugged in the subrack for at least 15 seconds.

Digital Extensions

As an example, digital system telephones may have the type designations DBC 2XX connected to ELU33.

Only one system telephone per line can be connected, no parallel telephone or extra bell.
NOTE: The board must not have any open cable ends.

ELU33

Figure 3.68: Example with system telephone DBC 2xx, ELU33 - MDF (32 pairs)
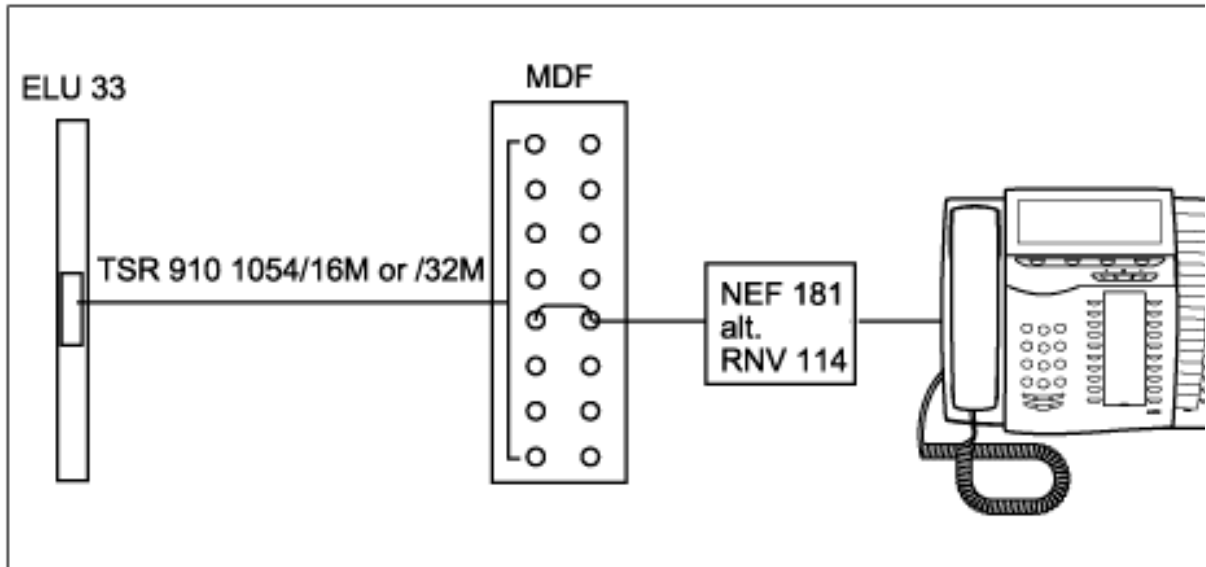
The installation instructions 1/LZT 102 537 and 1/LZT 102 762 show how the wires are connected to terminal block NEF 181 or RNV 114. Regarding connection of system telephone DBC 2xx:

see the installation instructions for *TELEPHONE SET DBC 220 01*

see the installation instructions for *TELEPHONE SETS DBC 222 01, DBC 223 01, DBC 224 01, DBC 225 01, KEY PANEL UNIT DBY 419 01 AND OPTION UNIT DBY 420 01.*

NOTE: ELU33 has to have individual 0 activated as the first individual and removed as the last individual, or else the communications with the board will fail. If done in the wrong order individuals will be blocked.

ISDN Extensions with ELU26

The ISDN-terminals are connected to the ELU26 board in the PBX through the MDF.

Figure 3.69: Example with an ISDN-terminal, 4-wire connection
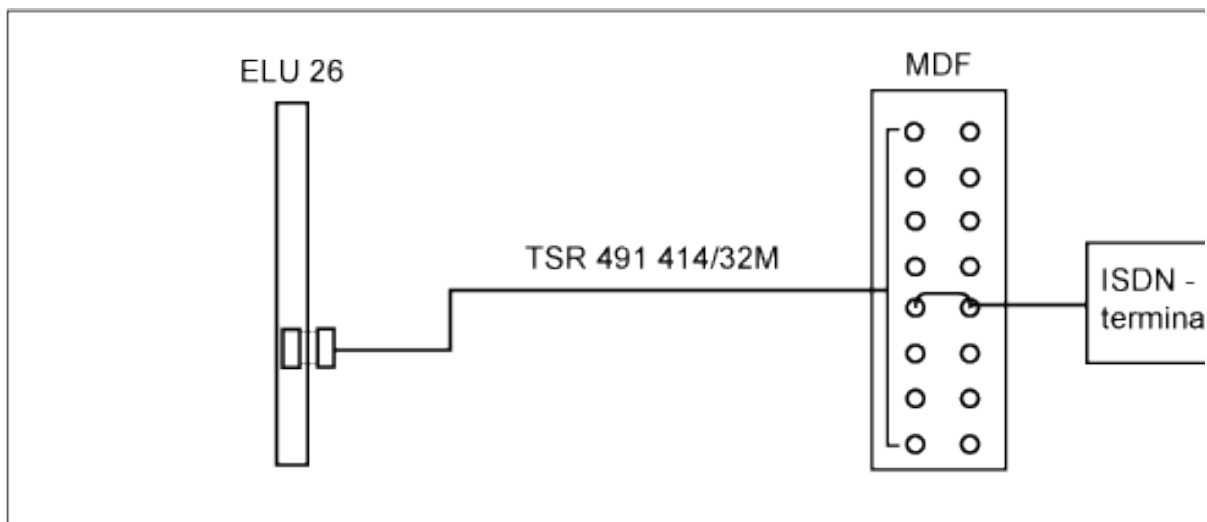
Cordless Extensions ELU31

To the ELU31/4, radio base stations, RFPs, are to be connected, see Figure ELU31/4 MDF - RFP on page 35. For more information, see Installation Instructions for CORDLESS PHONE.
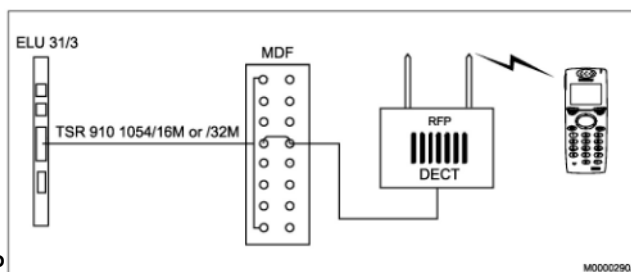
Figure 3.70: ELU31/4 MDF - RFP

NOTE: ELU31/4 can today be used in /3 or /4 mode. Check that the switch, both poles, are in correct position.
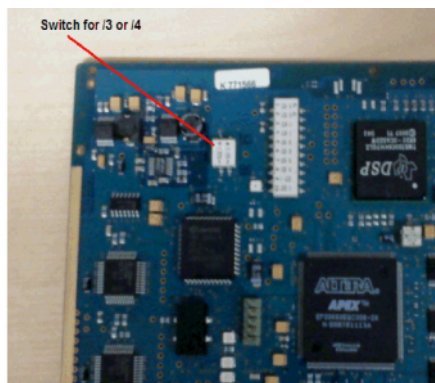
Figure 3.71: ELU31/4 - location of switch

Analog External Lines, TLU80 and TLU83

Analog external lines are connected to analog TLU boards.

Figure 3.72: TLU8x - MDF
example
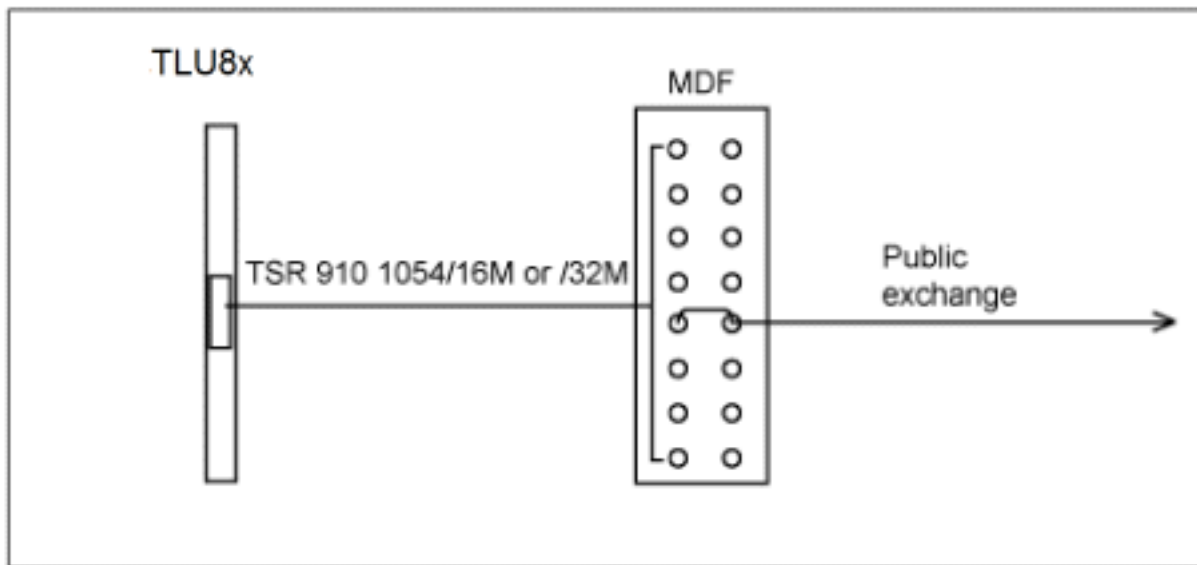
Digital External Lines

NOTE: If the ISDN T1 interface shall be connected outside the premises, it is mandatory to connect the T1 lines via a Network Terminal 1 (NT1), Channel Service Unit (CSU) or National Certified Terminal Equipment (NCTE) interface. This is essential in order to comply with US and CA regulatory safety requirements in force.

TLU77

Color coding for TLU77 with cable TSR4820211/xxx see item TLU76 and TLU77 cable structure.

Figure 3.73: TLU77, 120ohm pair cable
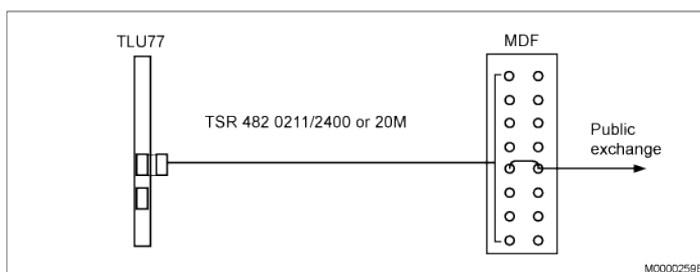
ISDN

ISDN PRI with TLU76/11

Color coding for TLU76 with cable TSR4820211/xxxx see item TLU76 and TLU77 cable structure.

Figure 3.74: Digital external lines 120 ohm pair cable, TLU76/11 - /14
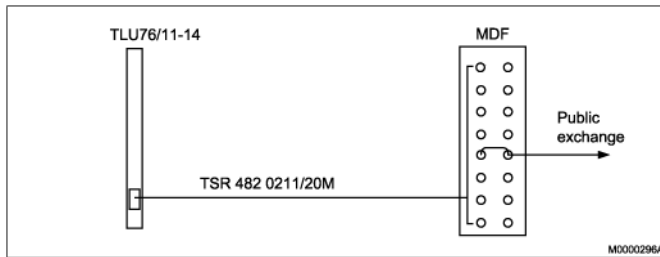
Digital external lines with TLU79 and an NT1-box, Network Terminal-box.

Color coding for TLU79 with cable TSR491414/xxx see item ELU26 and TLU79 cable structure.

Figure 3.75: 2-wire ISDN with TLU79 and an NT1-box (8

pairs)
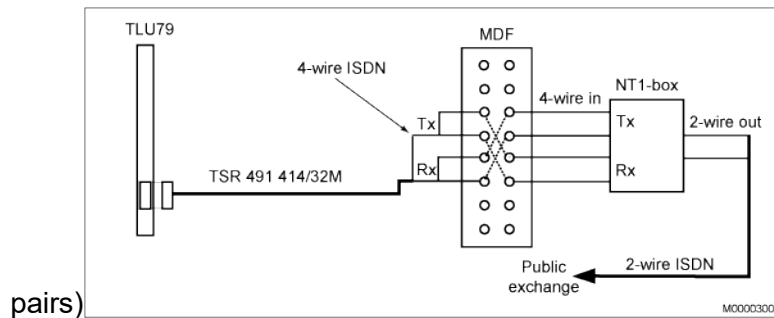
NOTE: Make sure that each individual's receive (Rx) and transmit (Tx) are properly connected between the TLU79 board and the NT1-box. Necessary corrections between the individuals can preferably be performed in the MDF.

Digital external line with TLU79 as a tie line

Color coding for TLU79 with cable TSR491414/xxx see item ELU26 and TLU79 cable structure.

Figure 3.76: Connecting TLU79 to TLU79 through MDF (8

pairs)
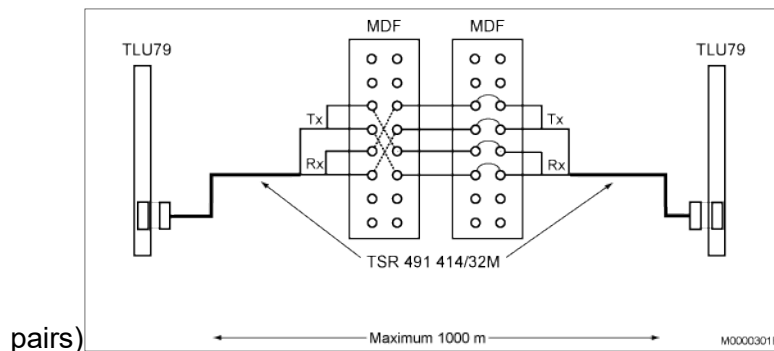
Through-Connection on Power Failure or Processor Malfunction

If the exchange is equipped with an FTU2 board, one to 32 extensions (8 per FTU2 boards) can be through-connected to the public network in the event of power failure or processor malfunction.

How to carry out the cross-connection, see the following figure.

These extensions must not be equipped with digital system telephones. If the public exchange is not capable of receiving DTMF-signals, then the extension must be equipped with a rotary dial telephone or a telephone for 10 pps (pulse generator). The connection to the public exchange must be of analog type.

Figure 3.77: Through-Connection on Power Failure or Processor
Malfunction
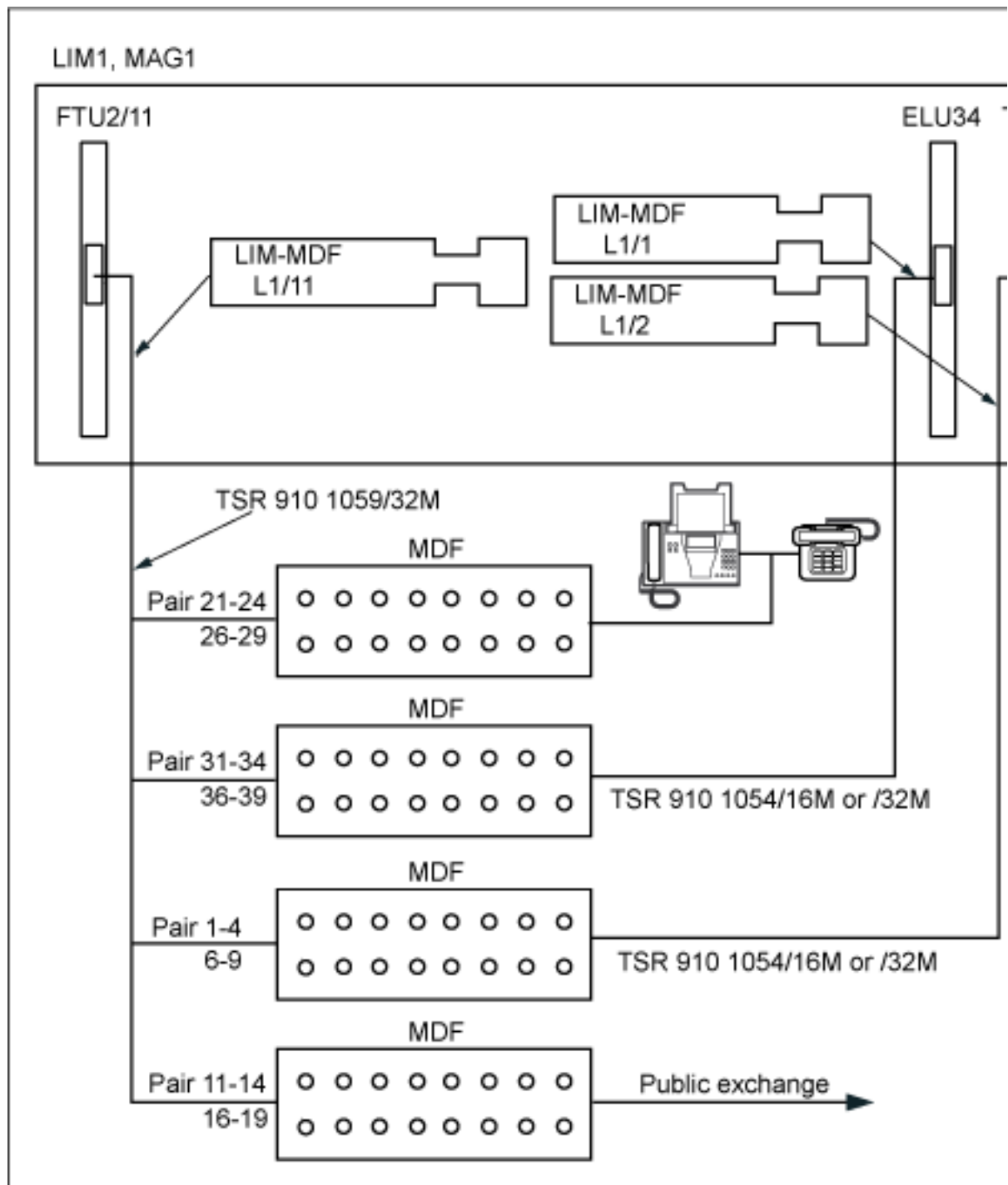
Call Metering

Call Metering TLU83/2

The TLU83/2 is needed as this board contains the call metering hardware. The metering frequency, of 12 kHz or 16 kHz, is set when the board is activated.

Private Trunk Lines (tie lines)

The SIP tie lines can be analog, digital or H.323. See Analog External Lines, TLU80 and TLU83or/and see Digital Extensions.

Alarms

General alarms can be monitored in several ways depending on how the system is configured.

In systems with MX-ONE Lite (3U chassis), the MGU board can supervise several alarms, both external and internal in the unit. The alarm input of MX-ONE Lite connects input A and B to the backplane. The MGU boards can then be configured to supervise these alarm inputs.

In systems with MX-ONE Classic (7U-chassis) and MGU boards, the simplest way is to use the alarm input on the DC/DC-board and configure the MGU boards to monitor Alarm A and/or Alarm B input.

When many external alarm shall be monitored or when system is not equipped with MGU boards, an ALU2 board can be used. The ALU2 board can receive up to eight different alarm signals and send out up to seven control signals. See the following figure.

If more in- or out- signals are required, the number of ALU2 boards can be increased. Alarm indications are normally transferred to the PBX operator consoles when using ALU2.

A internal power failure alarm for 5V DC is monitored by the MGU board.

Figure 3.78: ALU2 - MDF
connections
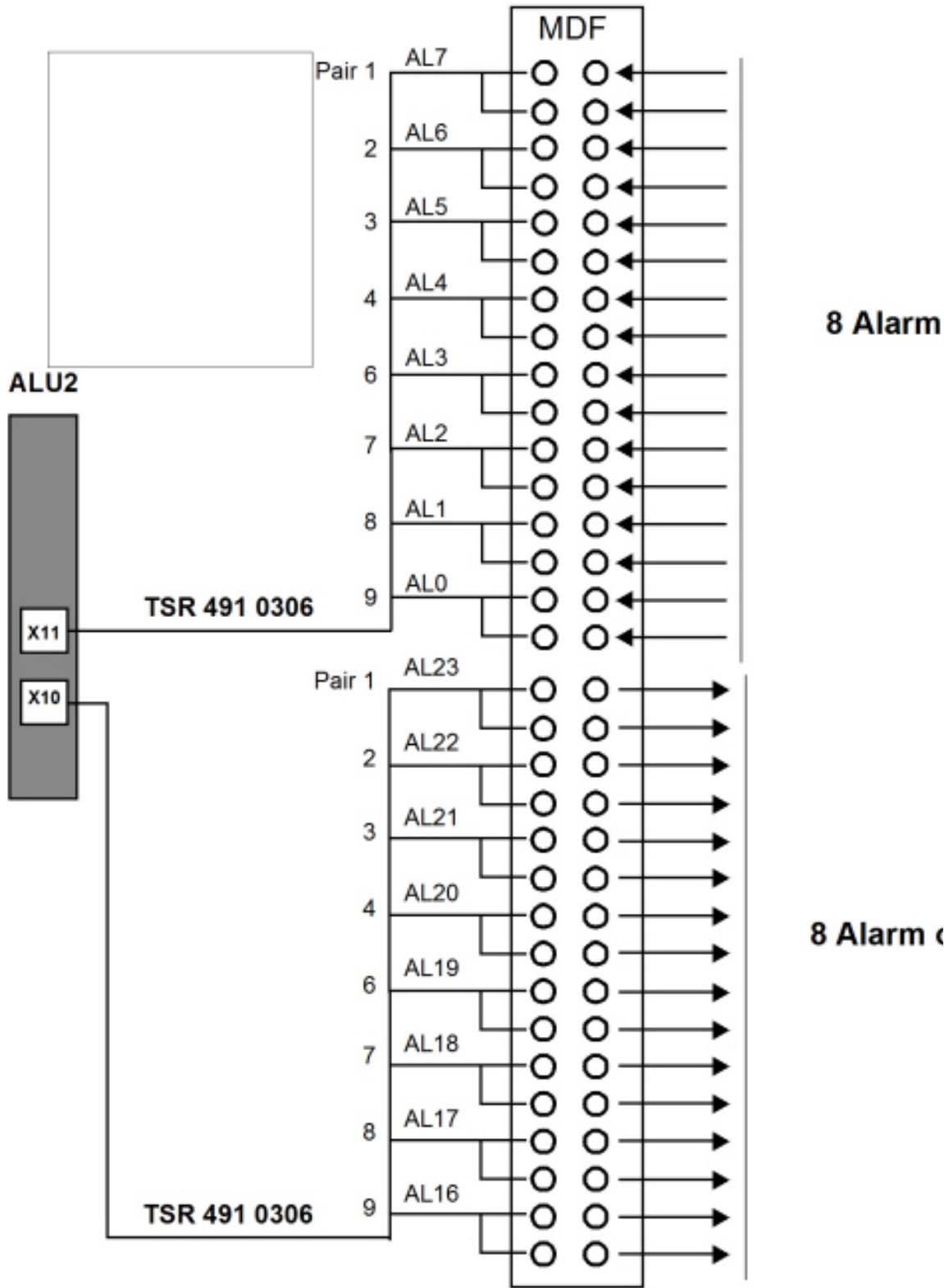
Fan Unit Alarm

Fan BFD 509 08/4

Connect the fan alarm cable TSR902 0274/2200 to the D-sub connector on the Fan, and connect the other end to the MDF; see the following figure.

Connect the Plug, SXK 106 2097/1 in the second D-sub connector on the Fan, to receive a signal loop.

Connect the ALU2 board to the MDF according to the cabling list for the site. Use cable TSR 491 0306 or similar. For an example of connection to the ALU2 board, see the following figure.

Figure 3.79: MDF Alarms for the Fan Unit BFD 509 08/4
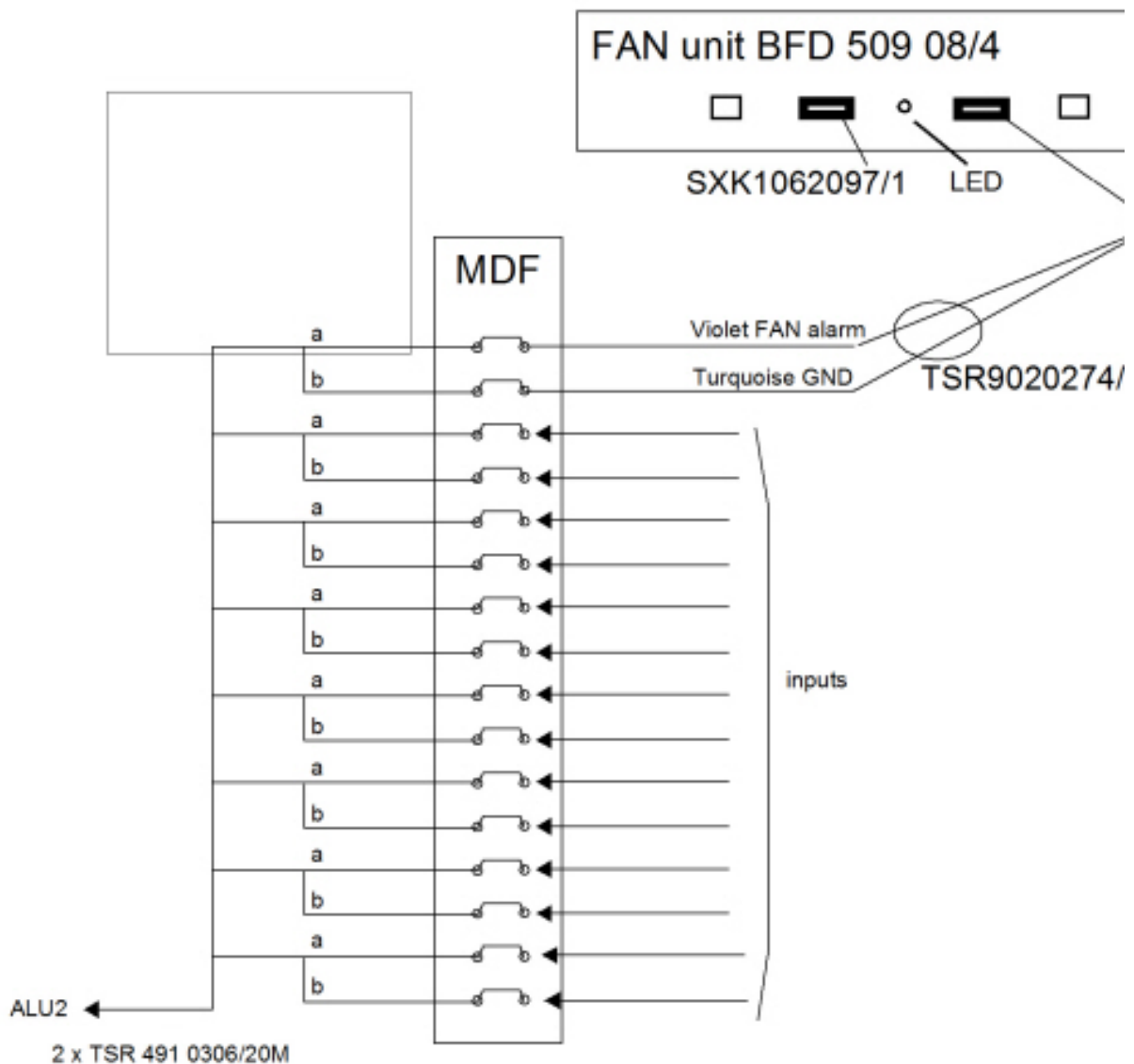
The Fan unit BFD 509 08/4 has the following alarm indicators:

- Yellow LED

The yellow LED is blinking when the Alarm is activated. The Alarm can be activated either by heat or lost of one of the -48V feeding.

Fan alarm_A is active when one or more of the conditions is/are:

- -48Va or -48Vb input is too low (towards 0 V) or
- the temperature is above 55 degrees C or
- the temp.sensor fails (out of range) or
- the FAN motor current is out of range or
- the FAN or motor voltage regulation fail

MX-ONE Lite, 3U unit, External Alarm

The **Alarm Input**, which is located on the rear side of the unit, has two pins, 1 and 3, which can be detected as alarms when either of them is closed to ground. To reach the connector on the backplane, remove the top cover and break out the small metal cover. Use a plier and fold back and forth until it breaks off.

Table 3.34: Rear Alarm Input 87L00039BAA-A

1	2	3	4
Alarm A (Relay)	GND	Alarm B (Relay)	GND

When any of the alarms is activated it will be detected by the MGU boards.

AC/DC Unit Alarms

The Alarms can either be connected through the ALU2-board or direct into the DC/DC-board in the 7U-chassis, or direct into the 3U-chassis.

Connect the AC/DC unit alarm relay contacts to the inputs of the ALU2 board through the MDF according to the cabling list for the site. The inputs of the ALU2 are internally tied to -48 V through serial resistors and the board can therefore detect loop or closing to 0 V. The resistance from the source to the ALU2 input should be maximum 20 kohm.

For 51305282

For information, see the documentation delivered with the product. These documents are also stored in the Alex data base in parallel with this document.

Document name: *Aspiro 1U in a 2U Enclosure, Instruction Manual PM110_6500_00* and *Quick Install Guide 100_6500_00-QR*.

The power system has a set of ports, alarm contacts, located on the rear side, that reflect different operating conditions for the power supply, see Figure 35: MGU Power Alarm Detection in MX-ONE Lite or Figure, Power and Fan alarm in Classic chassis and Supplier Manual. Wires to the different alarm units can be fastened to the ports.

The communication with the AC/DC-unit can also be done via the PCC unit 51305283. This unit is Optional. The unit have a RJ45-connector to communicate with the LAN.

AC/DC Alarm through MGU

MiVoice MX-ONE Lite 87L00039BAA-A with Power Unit

Figure 3.80: MGU Power Alarm Detection in MX-ONE
Lite
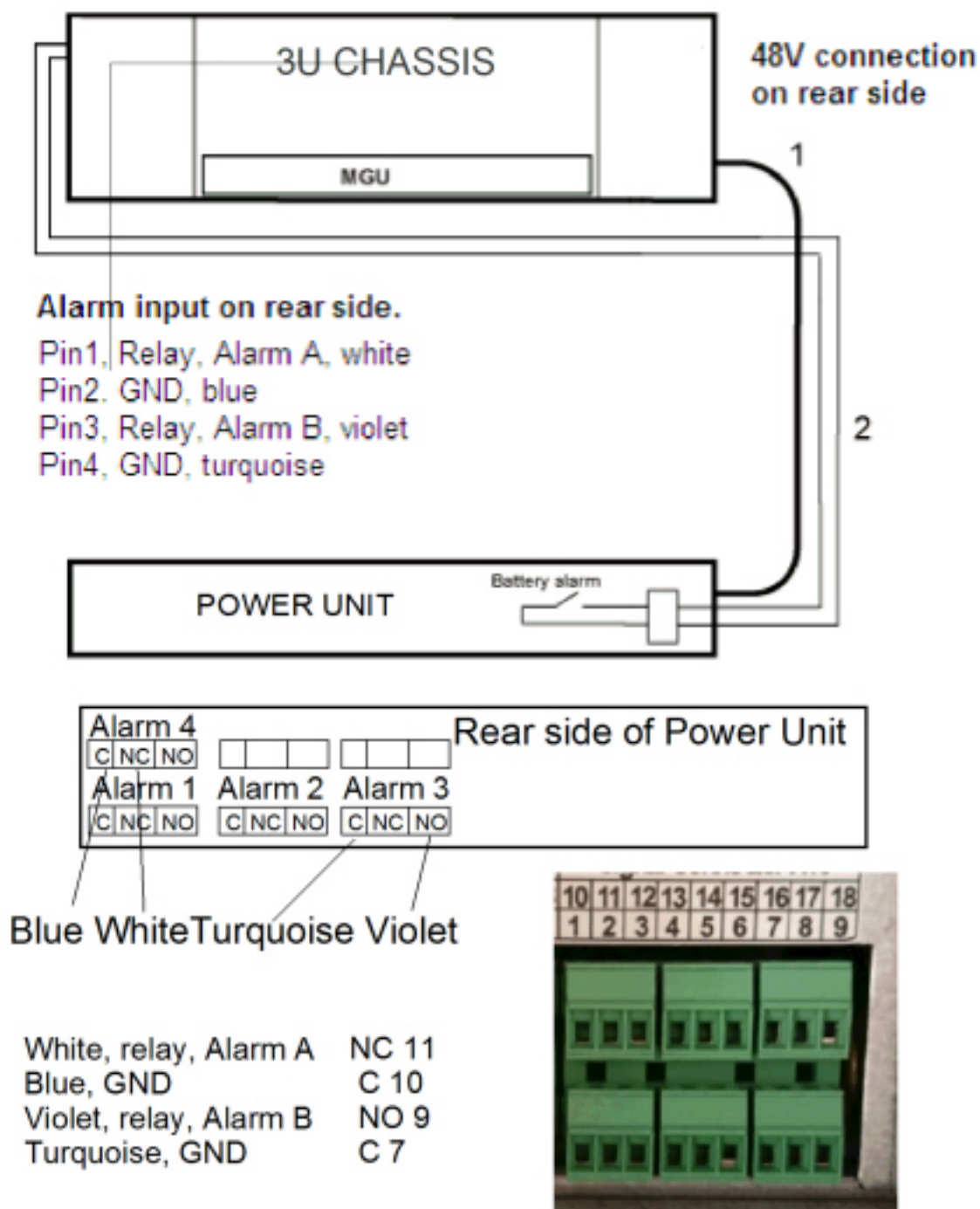
The following cables are used:

1. Power cable 51305285
2. Alarm cable 61L00007AAA-A (free end on power unit side)

The alarm cable is optional and needed when alarm handling is required.

To connect the alarm cable on the rear side of the chassis, a break-out plate has to be removed. Open the top cover and break out the plate. Use a plier and fold back and forth until it breaks of.

For details about the connections, see Supplier User Manual.

MiVoice MX-ONE Classic with Power Unit

Alarms from FAN_2 units and alarms from power supply, can be routed to the MX-ONE system via the ALARM inlet on either the DC/DC board if a MX-ONE Classic (7U-chassis) is used, or in the rear of a MX-ONE Lite (3U-chassis) if this is used.

The Supervision Extension port must be terminated with alarm plug SXK 106 2097/1 on the FAN_2 unit.

Figure 3.81: Power and Fan alarm in Classic chassis

White, relay, Alarm A   NC 11
Blue, GND   C 10
Violet, relay, Alarm B   NO 9
Turquoise, GND   C 7
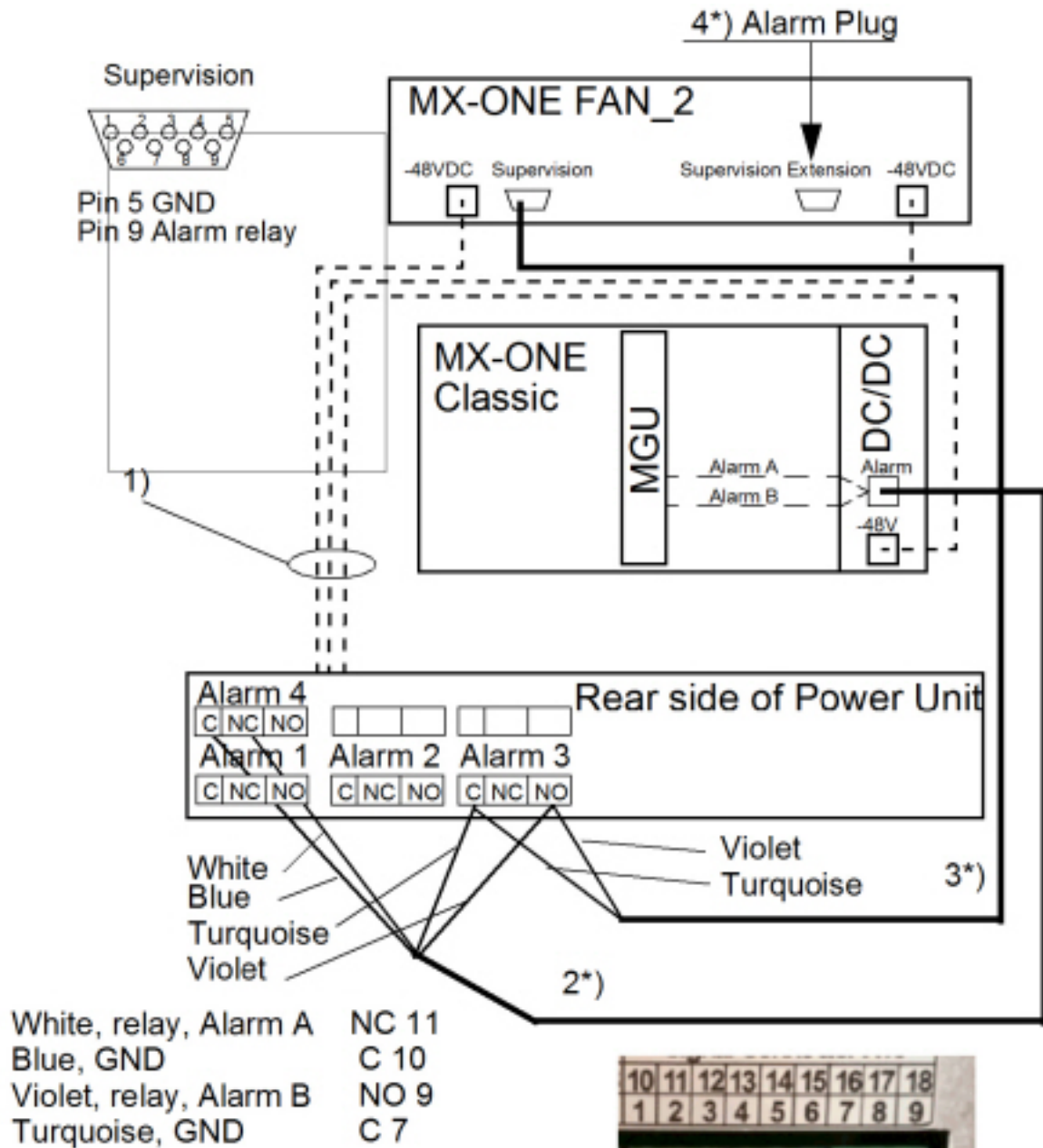
The following connections are used:

1. Power cable 53105286 (87) or Power splitter cable 50006938 (37) (Note: If only one (1) Power cable 53105286 (87) are used, the FAN_2 alarm will be activated)

2. * Alarm cable TSR 902 0277/2000 (free end on power unit side)

3. * FAN_2 Alarm cable TSR 902 0274/2200 (free end on power unit side)

4. * Alarm plug SXK 106 2097/1

*) Optional cables and plug. Needed when alarm handling is required.

For details about the power connections, see Supplier User Manual.

MX-ONE Battery Mounting Set

Table 3.35: Battery Mounting Set

MX-ONE Battery Mounting Set		
Mounting Set Types	**Existing (Mitel P/N)**	**ABB Description**
Battery mounting set	NTM144265	MX HW Mounting set BKB201003 **NOTE:** For MX-ONE 31A and 62A, 4x12V batteries: cable from PSU to battery, not included.
Screws for rack mounting the ABB PSU	NTM144264	Mounting set 4+4 screw+nut
Shelf for 4x12V batteries (31A or 62A)	NTM144266	MX material set for battery shelf (Includes 4 screws/nuts for rack mount, includes 3 units of 10mm distances for the batteries).

Installing and Configuring MiVoice MX-ONE

See the section *Installating and Configuring MiVoice MX-ONE*.

Upgrade

The upgrade instructions for MiVoice MX-ONE are discussed in this topic.

General

This document is written to provide an experienced technician with the information necessary to complete an update or upgrade operation of MiVoice MX-ONE.

For detailed information about the specific upgrade or update, see the release information for the specific release.

Rollback to the previously used software version can usually be done automatically.

NOTE: If upgrading from MX-ONE 6.x (or older release) to MX-ONE 7.0, rollback is not possible, due to license, encryption, security and OS version changes. A new installation of the older release will be required in case the upgrade fails.

Definitions

Upgrade

An upgrade package can consist of fault corrections, enhancements of functionality, and new functionality.

Update

An update package consists of fault corrections.

Releases

The following types of releases can be made available for MX-ONE.

Major Release

A Major Release is a complete release of MX-ONE. The package includes new and enhanced functionality as well as fault corrections. An upgrade to a new major release will usually require downtime of MX-ONE.

Dot Release

A Dot Release is an upgrade package including a complete release of MX-ONE. The package includes enhanced functionality as well as fault corrections. An upgrade to a new dot release will usually require downtime of MX-ONE.

Service Pack

A Service Pack is an update package applicable to a specific Major or Dot release. The Service Pack installation should normally have small impact on the system, but might involve a restart of the system, and down-time for the system.

A Service Pack mainly includes fault corrections released since the previous Major or Dot release. It replaces all previously released Service Packs for the same Major or Dot release.

Hotfix

Hotfix is a collection and accumulation of fixes for service-affecting issues and may include internal bug fixes. A hotfix replaces the latest service pack. Hotfixes can be applied through download tools.

Preparations

Backup Present System

Before starting the actual upgrade/update procedure, make a safety backup of the system and save the resulting files in a safe place. The backup can then be used in case the update or upgrade operation might fail. For more information about backups, see operational directions for *ADMINISTRATOR USER'S GUIDE.*

NOTE: Make a back up of MX-ONE Provisioning Manager before the update or upgrade if the tool is installed on the server.

Upgrade at Low Traffic

Even though the impact on the system usually will be very limited, it is strongly recommended to make the upgrade or update when the traffic is very low in the system. If it is necessary to restart the system, all ongoing calls will be cut off and lost.

Ensure Sufficient Disk Space

Disk space of at least 16 GB must be available in each Server (LIM) that is going to be upgraded. A number of MX-ONE Service Node Software (SW) versions can reside on disk simultaneously although just the active version, which is normally the one with the highest revision number, is needed. Disk memory can be set free by removing unused MX-ONE Service Node SW versions.

To free disk memory, see operational directions for *ADMINISTRATOR USER'S GUIDE*.

NOTE: When upgrading a system in the range of 20 to 32 Servers, with an ASU as server in Server 1, consider to take safety backups of configuration mirrors and then delete them from the disk, or else it will not be possible to have more than two upgrades available (on disk).

Execution

OS Upgrade

The Operating System, OS occasionally needs to be upgraded. The upgrading software will be available as ISO image files. OS upgrades will be released together with MiVoice MX-ONE Service Node SW update or upgrade releases. The release notes will tell if the OS should be upgraded before or after the MX-ONE Service Node SW upgrade. The OS upgrade operation must be performed on each Server (LIM) separately. The upgrade is performed when the system is operational. When the operation is finished a reboot is necessary.

For details, see details see Release notes SUSE Linux Enterprise Server 12 SPx.

MX-ONE Telephony System Upgrade

MX-ONE can be either a single-Server or a multi-Server system. In a multi-Server system, the upgrade must be performed on Server 1.

For Service pack updates, see applicable release notes for more information.

The execution in a Server (LIM) can be monitored with the command:

```
tail -f /var/log/localmessages
```

Execution

1. Upload the new package to directory `/local/home/mxone_admin/install_sw/` and make sure that the package has the correct properties (execute permission for mxone_admin).
2. On Server 1, log in as user mxone_admin.
3. Key command `sudo -H /opt/mxone_install/bin/mxone_maintenance` to start MX-ONE Maintenance Utility.
4. Select option Package handling - Add new package to the system.
5. Follow the procedure as instructed on screen.
6. Select option Package handling - Distribute package across the system.
7. Follow the procedure as instructed on screen.
8. Select option Upgrade MX-ONE Version - Prepare for upgrade.
9. Follow the procedure as instructed on screen.
10. Select option Upgrade MX-ONE Version- Upgrade.
11. Follow the procedure as instructed on screen.

SLES 12 Update Packages

This section is valid for both SLES Service Packs and for SLES patch packages.

NOTE: All existing mount points of the remote file system, for example: `/srv/ftp` must be removed before starting the update. Before copying the iso image (also the Recovery

Image-MX-ONE_7.X.spX.hfX.rcX.iso could be used as upgrade media for Service Packs, SP) or tar file (for patch package), make sure that there is enough free disk space on root partition. At least 1.3 times the size of the SP or patch package is needed.

NOTE: The possibility to apply Service Packs was introduced in MX-ONE 7.1.

NOTE: After upgrade to SLES 12 SP5, rollback of MX-ONE system is not possible.

NOTE: Use the *mxone_admin* home directory to save the iso or patch package.

Upgrading Procedure

1. The MX-ONE system should be upgraded to MX-ONE 7.3 or later.
2. Check that the system works properly before upgrade of the Operating System. Rollback is not possible after SLES12 SP5 has been applied.
3. Upgrade to SLES12 SPx.
4. Reboot the complete system after upgrade of OS.
5. Apply SLES patches.
6. Reboot the complete system.

Preparing for Installation of SLES 12 SPx

As user mxone_admin, copy the SLES 12 SPx iso image also the Recovery Image-MX-ONE_7.X.spX.hfX.rcX.iso could be used as upgrade media for Service Packs (SP) or tar file (for patch package) and md5 sum file to the file system at server 1.

NOTE: If checksum file is missing, the update cannot be done.

Figure 4.1: Main menu for MiVoice MX-ONE
Maintenance

```
           MiVoice MX-ONE  Maintenance Utility on server 'randersson-MX7-Server1.mxone'
Main menu for MiVoice MX-ONE maintenance

       package_handling    Package handling in the system
       upgrade             Upgrade MiVoice MX-ONE version
       rollback            Rollback MiVoice MX-ONE version
       repair              Repair server or ssh keys in system
       uninstall           Uninstall complete system, all MiVoice MX-ONE versions
       server              Server in system
       lim                 Lim in system
       sby_server          Standby server in system
       license             License handling
       market              Market setting
       diff_serv           Diff serv parameters
       bonding             Bonding settings in system
       cluster             Cluster handling
       dns_forwarding      DNS forwarding settings
       seccheck            Seccheck settings
       user                User management in server
       webmanagment        Web server config
       addon_software      Manage addon software
       linux_software      Manage SLES software repositories (ServicePacks or Patchpackages)
       certificate         Manage Certificates and TLS settings in MX-ONE
       media_server        Manage settings for Media server
       cassandra_database  Cassandra database handling
       more_configuration  Manage settings in linux snmp, ntp, banner, iptables, ssh, password op



                      <  OK  >                   < Exit >
```

Removing of Existing SLES Software

1. Login to the server 1 as mxone_admin.
2. Key in the following command:

   `sudo /opt/mxone_install/bin/mxone_maintenance` to start MX-ONE Maintenance Utility.

3. Select option **linux_software** > **remove** to remove existing SLES software repositories (zypper repositories).

4. Select option **linux_software** > **add** to add a repository to all servers in the system.

5. Select option **linux_software** > **update** to update the system with Service Pack or Patch package.

6. After successful update, reboot all servers, and use **mxone_maintenance** > **linux_software** > **reboot.**

Rollback

A rollback is the action to undo all operations back to the latest successful release.

If upgrading from MX-ONE 6.x (or older release) to MX-ONE 7.0, rollback is not possible, due to license, encryption, security and OS version changes. A new installation of the older release will be required in case the upgrade fails.

General

Automatic rollback is supported on the MX-ONE Service Node level. The operation is selected from a menu when running the MX-ONE Maintenance Utility.

The execution in a Server (LIM) can be monitored with the command:

```
tail -f /var/log/localmessages
```

Execution

1. On Server 1, log in as user mxone_admin.
2. Key the following command:

   ```
   sudo -H /opt/mxone_install/bin/mxone_maintenance to start MX-ONE Maintenance
   Utility
   ```
3. Select option Rollback MX-ONE version.

4. Follow the procedure as instructed on screen.

Introduction

MiVoice MX-ONE (MX-ONE) is a communication system that runs on Linux operating system.

MX-ONE is composed by Service Node (a Communication Server) and Media Gateways or Media Server.

The main component of MX-ONE is Service Node, which runs on a Linux distribution called SUSE Linux Enterprise Server (SLES).

Operating System is often updated to add new functionality, fix faults, and security vulnerabilities.

Mitel is committed to deliver package updates with new Operating System version to MX-ONE as soon as they are available in the market.

Because of the technology evolution, the market is often introduced with a new operating system and requires a new installation process for that. For example, moving from 32 to 64 bits machines. Sometimes, the new operating system contains different types of kernel structures that requires a new installation to get benefit from the new improvements that kernel provides/requires. So, this is a challenge that an open platform as Linux adds to the overall system solution.

Additionally, the MX-ONE software is often updated which also requires upgrade. Sometimes the upgrade takes more time and customers cannot afford to have downtime for more than a couple of minutes due to critical service offered by MX-ONE. Likely, there are technologies available in the market that helps a partner/customer to make upgrade faster and more frequent.

The primary aim of this document is to explain how an upgrade/new installation of a MX-ONE system can be done via VMware (virtualized systems) or Hardware Simulator (standard physical servers, sometimes called Bare Metal).

In summary, the goal of the document is mentioned as follows:
• Explaining the straight forward procedure for existing customers with an MX-ONE 5.x or 6.x virtualized system migrate to MX-ONE 7.X with significantly reduced the downtime.

- Explaining about the same procedure that could also be a way to move an existing MX-ONE 5.x or 6.x customer system from a "bare metal" server environment to a new hardware (bare metal) or virtualized environment with MX-ONE 7.X.
- Explaining about the same procedure that could also be used by large systems running MX-ONE 7.X to upgrade the system to a recent MX-ONE 7.X version.

Benefits

The process described in this document has the following benefits for a partner/customer.

Re-use of the existing virtualization data center environment tools.

- Virtually the same process for migration from a standard physical server environment to a Private cloud (virtualized) environment.
- Prepare the *"time intensive"* parts (Installation, configuration) offline during normal office hours.
- Pre-test features in new system in the *"migration"* network environment without affecting live traffic.
- Actual *"cut-over"* downtime reduced to an hour of less in most cases.
- Can be done by your Channel partner or through Mitel Professional services.

Requirements

MX-ONE should run a previous version, for example, MX-ONE 5.0 SP1 or MX-ONE 6.X.

The MiVoice MX-ONE system is composed by the following main components:

- Service Node
- Media Gateway Unit (MGU) / Media Server
- Service Node Manager
- Provisioning Manager

The minimum requirements are:

From that system, all information needs to be collected and backup.

- Backup of all systems (Service Node, Provisioning Manager, Service Node Manager, Media Server, MGUs, and so on)
- PC-Regen of the system

New software available (Service Node, Provisioning Manager, Service Node Manager, Media Server, MGUs, and so on).

- VMware infrastructure for virtualized systems
- Extra Hardware for the standard systems
- Licenses

MX-ONE Running On Virtualized Environment

MiVoice MX-ONE is validated to work in VMware environment. To prepare the new MX-ONE system, the following material VMware software is required.

- vSphere 5.5 or 6.X infrastructure with vCenter, vMotion, and VMware tools

- Minimum 3 networks in the virtualized environment
- Enough capacity to create additional Virtual Machines
- PC or a PC VM to be used to collect the PC-Regen data as well as access the system

For more information regarding MX-ONE virtualized, check the *MX-ONE CPI* documentation.

MX-ONE Running On Standard (Bare Metal) Environment

A system running in a standard physical server can also be updated following the procedure that is described in the next chapters; however, the requirements are different. The following are required:

Servers or a MX-ONE hardware chassis with ASU-II cards

Switch/switches

PC to be used to collect the PC-Regen data as well as access the system

For more information regarding MX-ONE standard, check the *MX-ONE CPI* documentation.

Network Definitions

The VMware environment will require 3 networks to create the new system.

The standard physical server environment requires 2 or 3 network segments and VLANs can be used to the achieve it.

The networks definitions are:

- Network 1 (Production), the existing Production network where the current MX-ONE system is running and it is connected to the rest of customer network.

  NOTE: This could be an existing bare metal centralized system that should be on its own "subnet" connected to the rest of the customer network.

- Network 2 (Migration), the migration is the network used to create the new MX-ONE that needs to provide the same characteristics as the Production (same IP addresses, Default Gateway, etc.). However, this network needs to be completely isolated during the preparation/test phase.
- After migration, this essentially replaces the existing Production network. If the current Production Network has several subnets where servers are placed in, this network also need to have same routing setup between the involved subnet's. This requires a special VLAN set in the switches, that are replicated in the VMware network setup for Network 2 (Migration).
- Network 3 (Shadow), which is used to move the original MX-ONE system, as phase 1 of the migration. It is a completely isolated from the customer network. That network is used to avoid duplicated IPs when migrating the Service Nodes.

NOTE: If it is a physical server environment network, the new MX-ONE server's subnet needs to be separated/disconnected from the rest of the network. The new system needs to be kept running *"offline"*, but isolated from the Production network. In this case, the Shadow network is not mandatory; because, the cables are moved in the switch/switches. So, if the cables are moved in three steps and they are placed in the correct ports, there is no risk for duplicate IP addresses.

The three steps cables migration process is the following:

1. Disconnect the Ethernet cables from original MX-ONE from the Production network switch.
2. Move the Ethernet cables from the new MX-ONE system to Production network switch.

3. Move the original MX-ONE system to the Migration network switch.

Setup

Virtualized

The VMware infrastructure should be in place. The main activities are:
- Creation of the two new networks: Migration and Shadow
- Deployment of MiVoice MX-ONE OVAs

Setting up a Network Using VMware

This section provides network setup information related to VMware and Hyper Virtualized environments.

In the VMware® infrastructure, the Migration and Shadow networks need to be created, if you have a need for several subnets, then you might have to involve the administrator of the network.

The multi subnet is not covered, but it has the same principles to add more network elements as shown in the below figure. Contact your VMware administrator to create the networks.

Figure 4.2: Virtualized Environment Before Upgrade
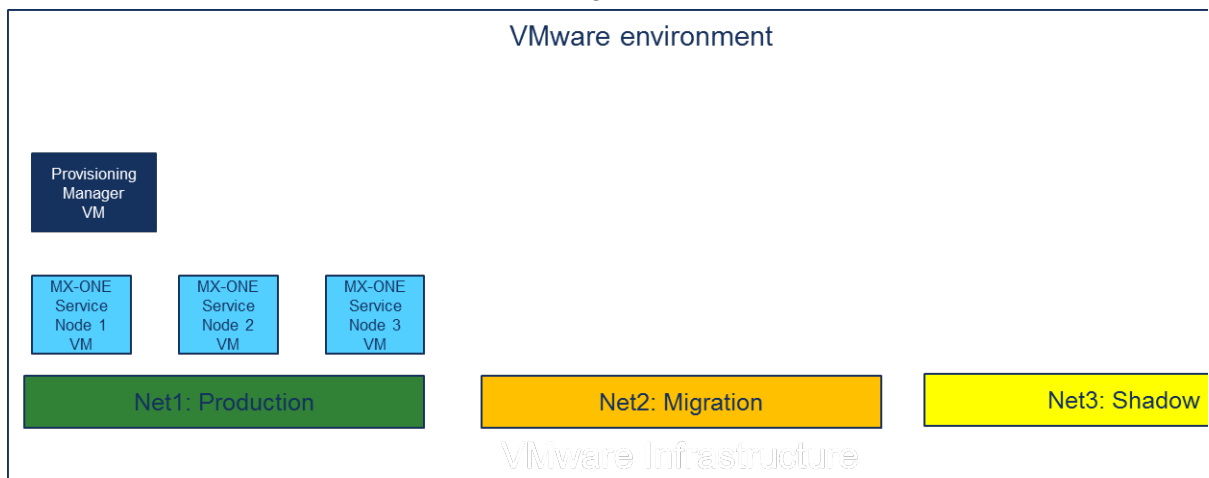
Below figure shows the VMware network setup screen for the following networks:
- NetXXXX66 is the Production network
- MigrationNet66 is the Migration network
- ShadowNet66 is the Shadow network

Figure 4.3: VMware Network Setup
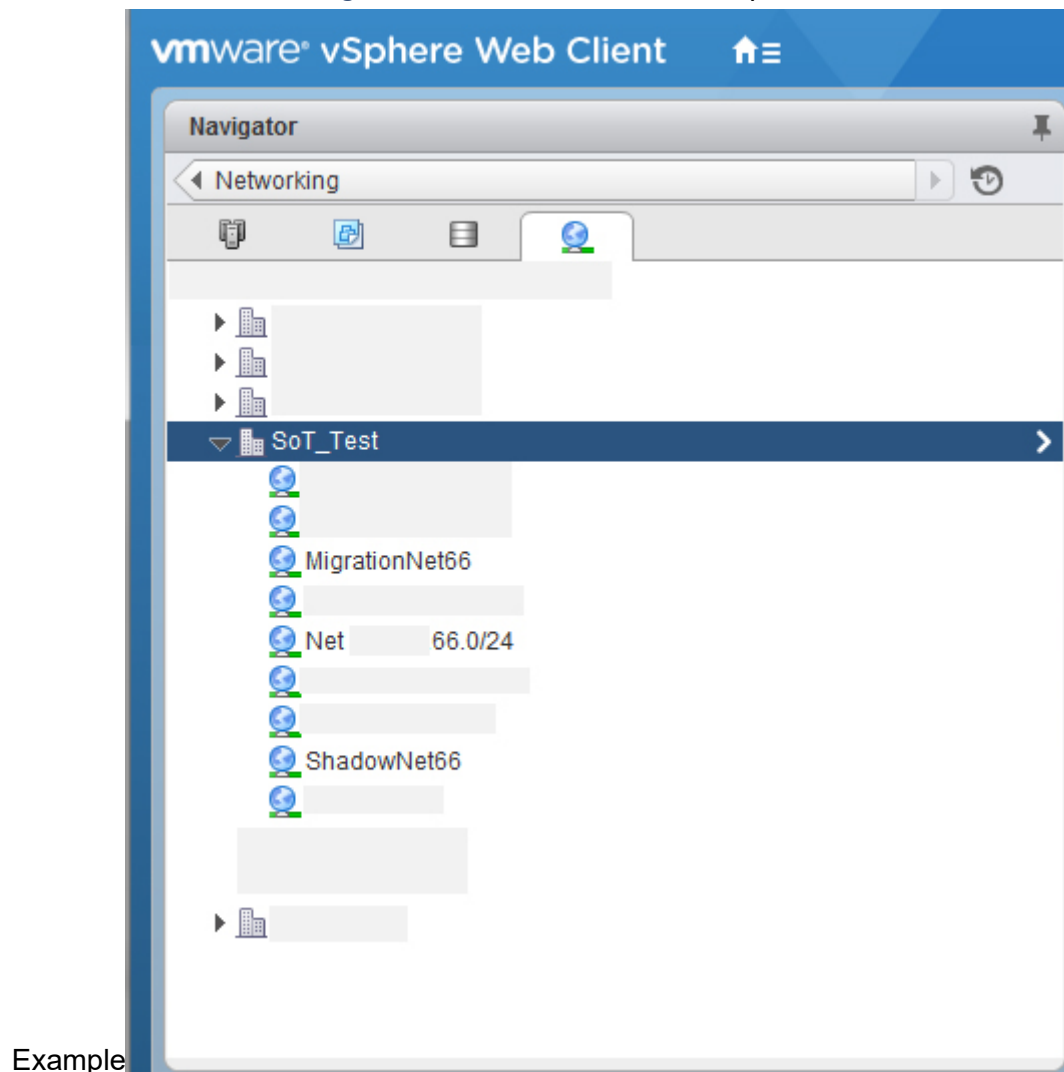
Example

Installing Microsoft Hyper-V®

To install a Hyper-V machine make sure your system meets the following requirements:
- Installed Windows Server 2008, 2012, or 2016
- Have a Windows License (no other special licenses needed)
- Runs on a Dell and HP server
- Have .vhd and .vhdx format image for installation

You can install Hyper-V using a PowerShell or in a GUI. To enable Hyper-V using a power shell:
1. Open a PowerShell console as Administrator.
2. You can do either of the following:

  – Run the following command: `Enable-WindowsOptionalFeature -Online -FeatureName Microsoft-Hyper-V -All`

Figure 4.4: Windows
PowerShell
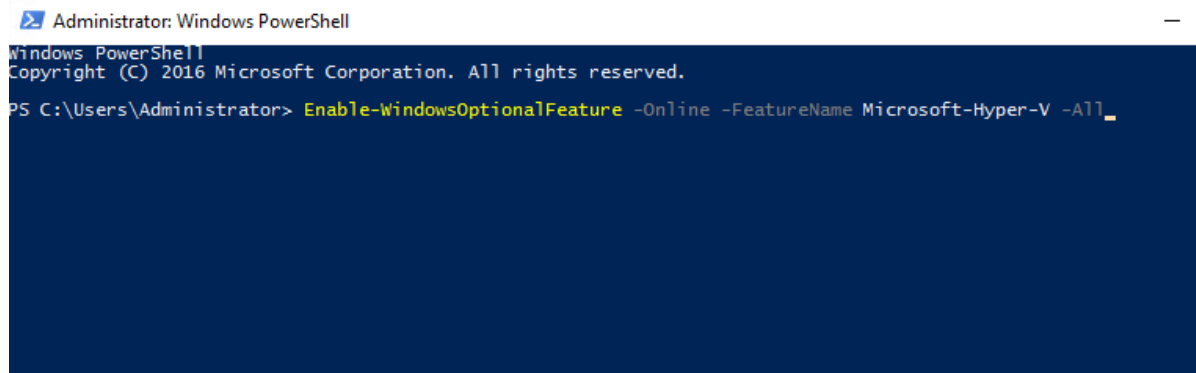
– Open **Server Manager** and select **Server Roles** to add role and features and install Hyper-V.

Figure 4.5: Server Manager - Configure Local
Server
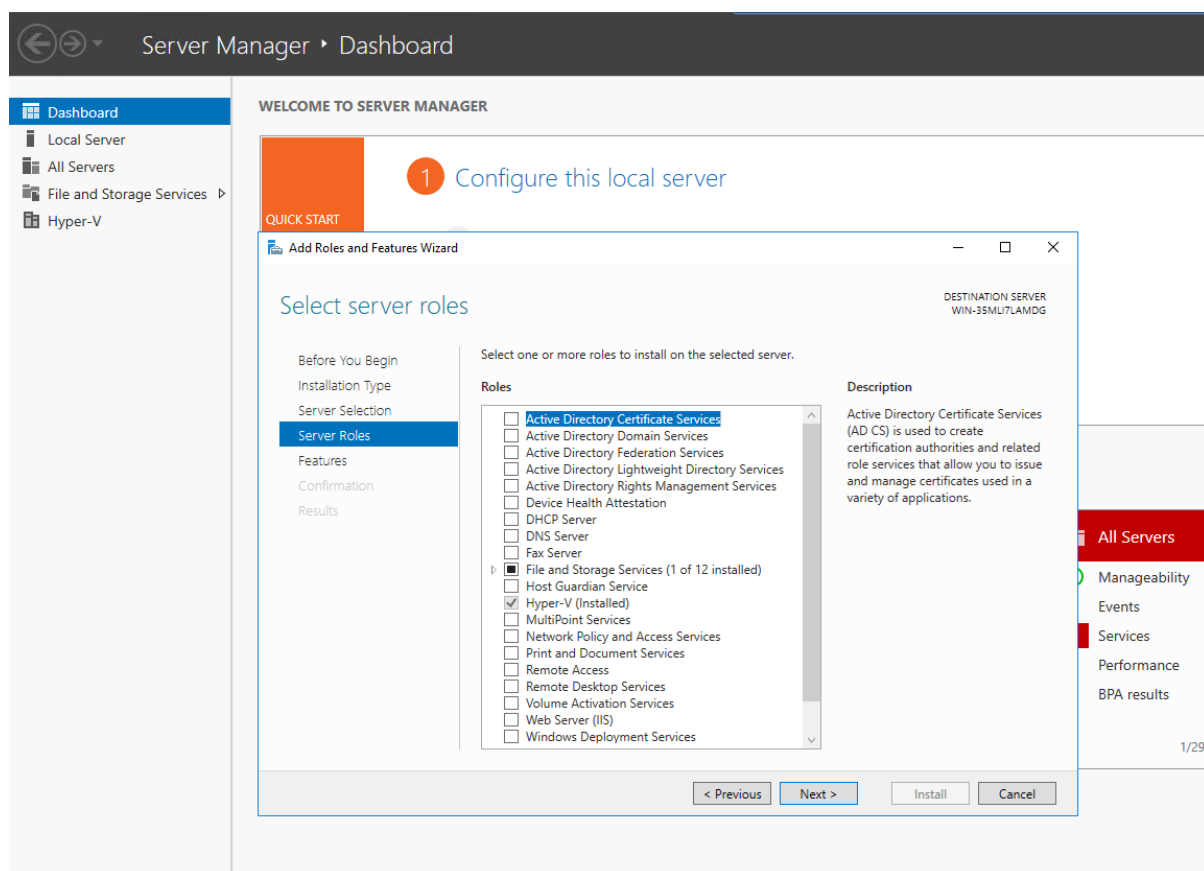
Figure 4.6: Adding roles to
Hyper-V
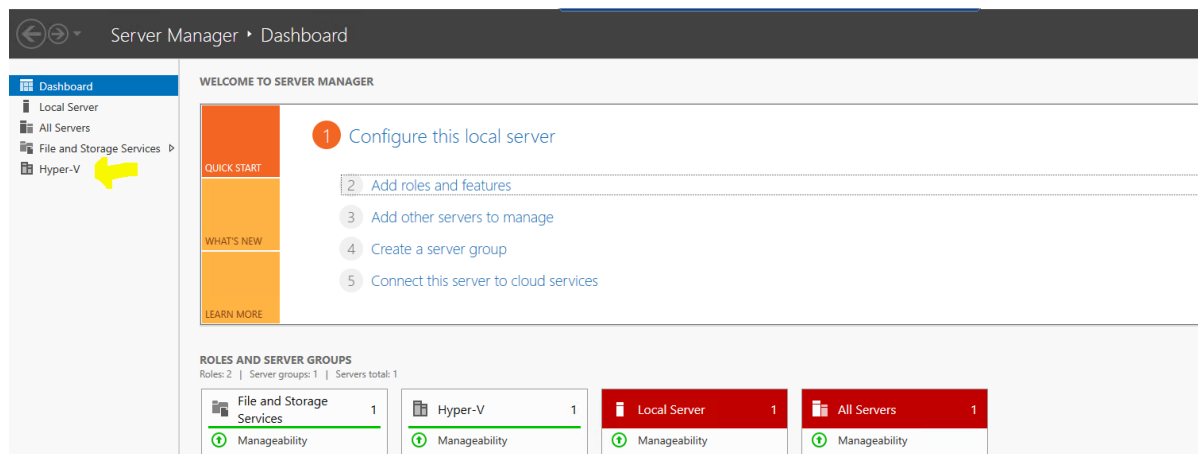
Figure 4.7: Microsoft
Hyper-V
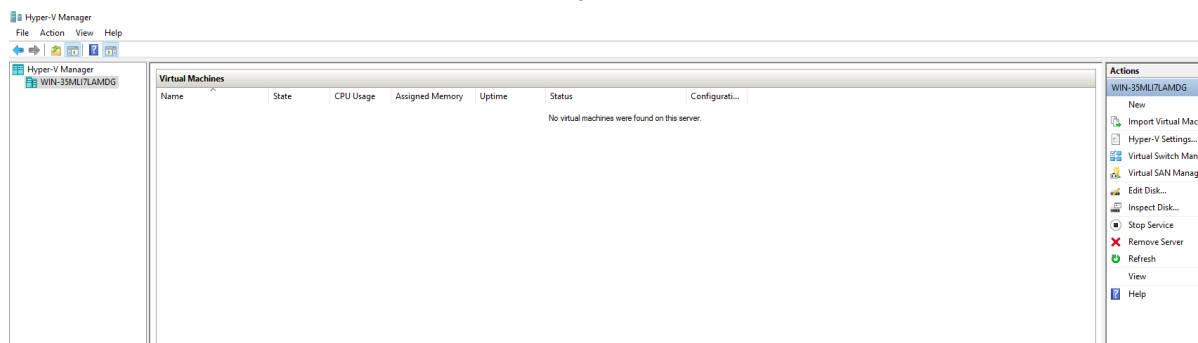
Deploy MiVoice MX-ONE OVA

To deploy MiVoice MX-ONE OVA, do the following:

1. Create the number of Service Node / Media Server standalone Virtual Machines required based on size of the current MX-ONE system.

2. Consider consolidation of server/Media Gateways to reduce server footprint. The below figure shows the built of new system.

   NOTE: A PC is required to connect to the systems that are having access to both Production and Migration network.

Figure 4.8: Virtualized Environment After Deploy of New System
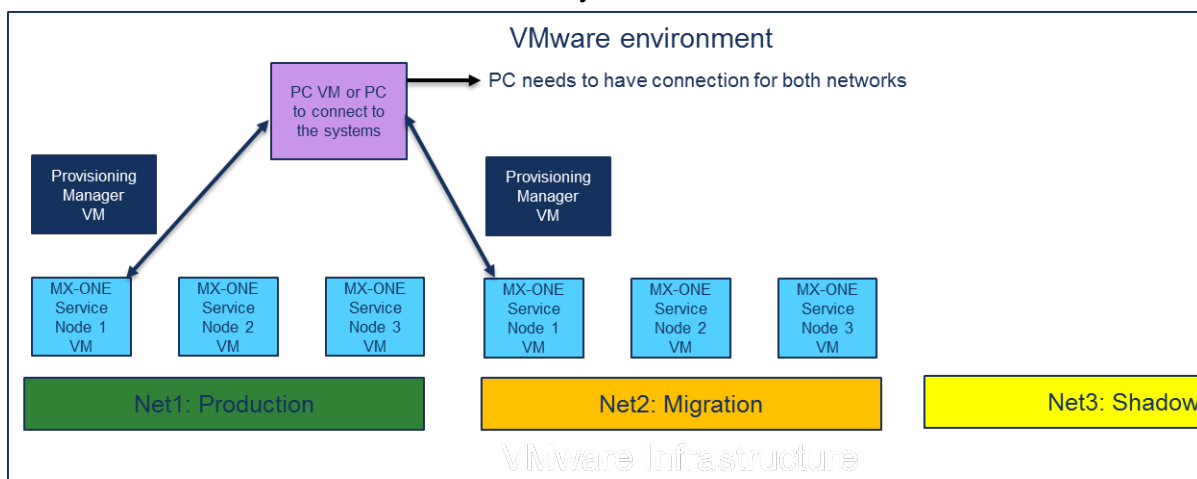
3. Install the new MX-ONE system. The Service Node is installed in the Migration network.

Figure 4.9: Deploying a New MX-ONE OVA
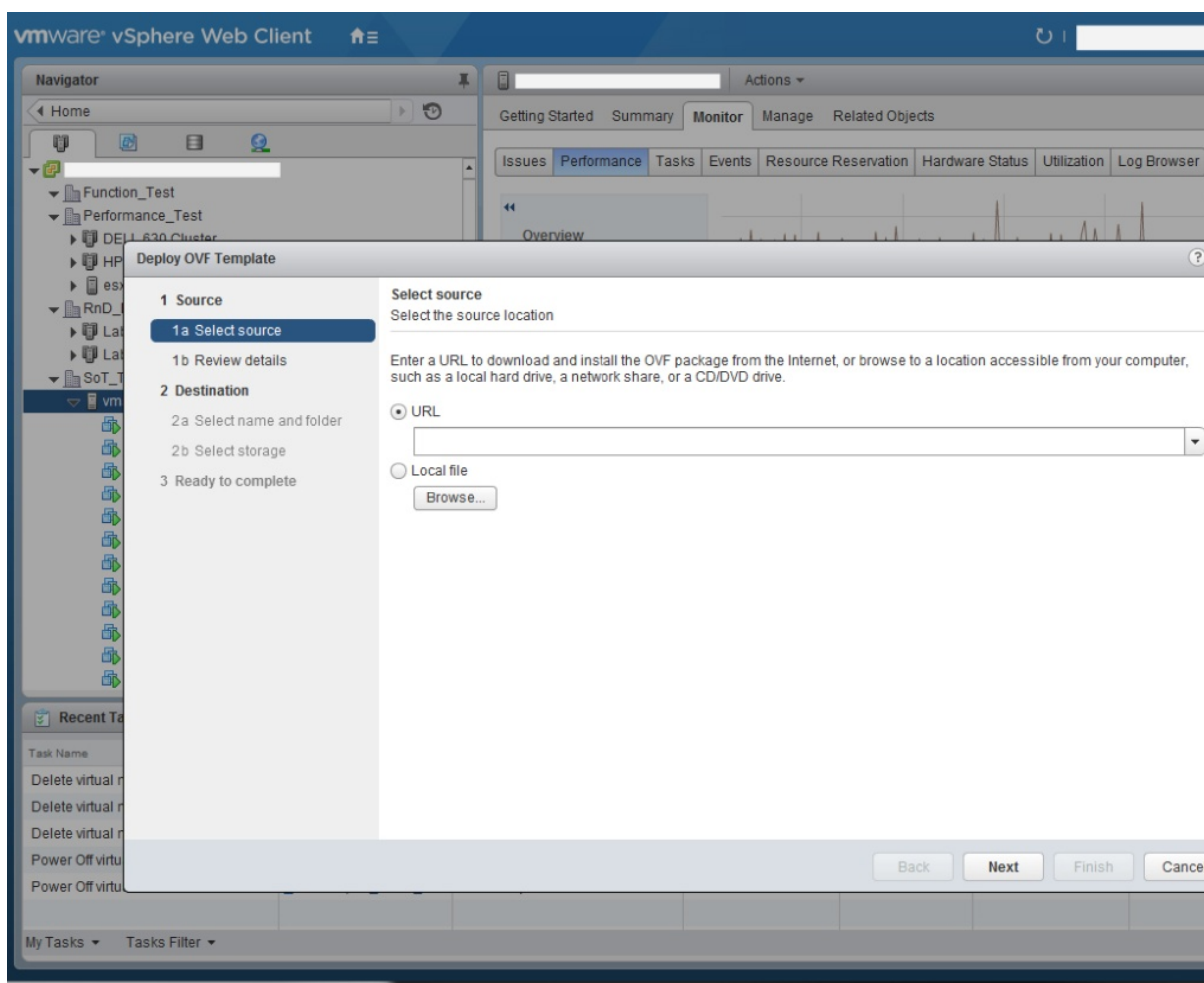
4. Select the OVA file.

Figure 4.10: Selecting the
OVA
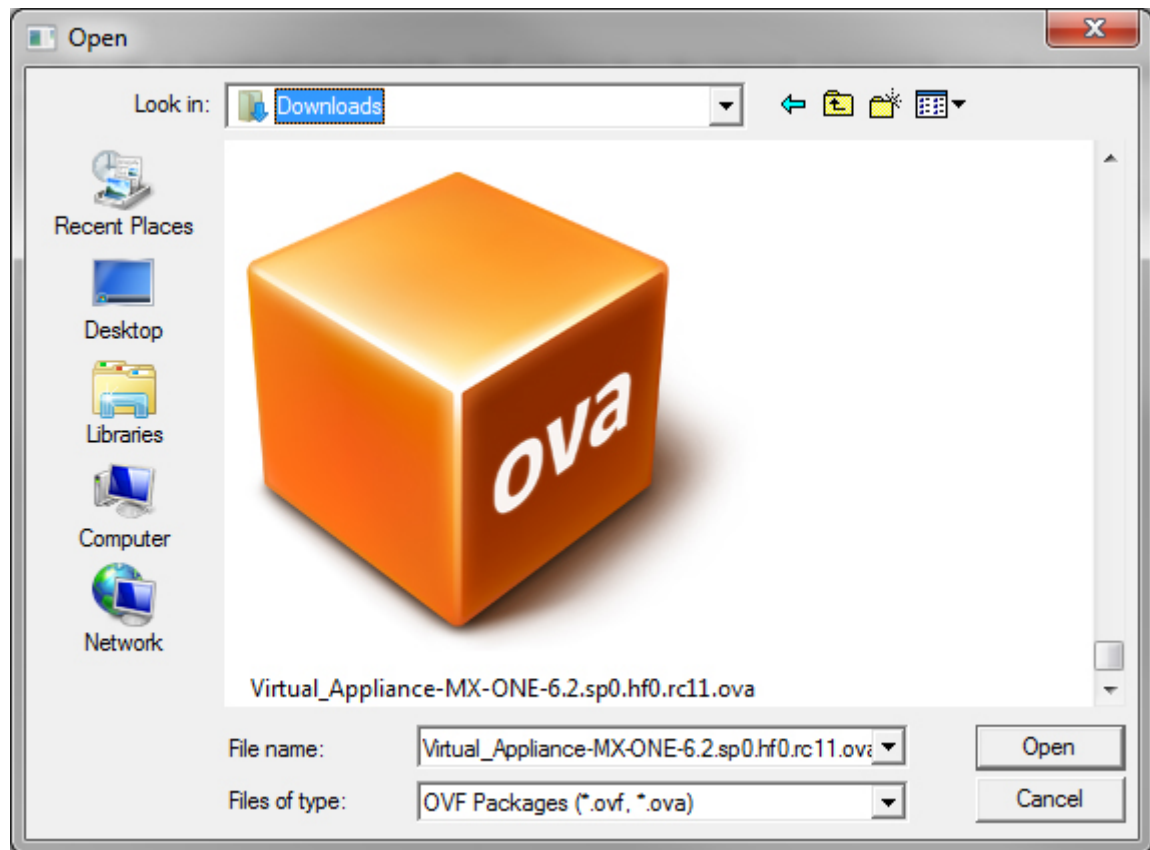
5. Check if the Service Node is in the Migration network as soon the deployment is done. In the example, the MigrationNet66 is used.

Figure 4.11: Verification of the MX-ONE VM
setup
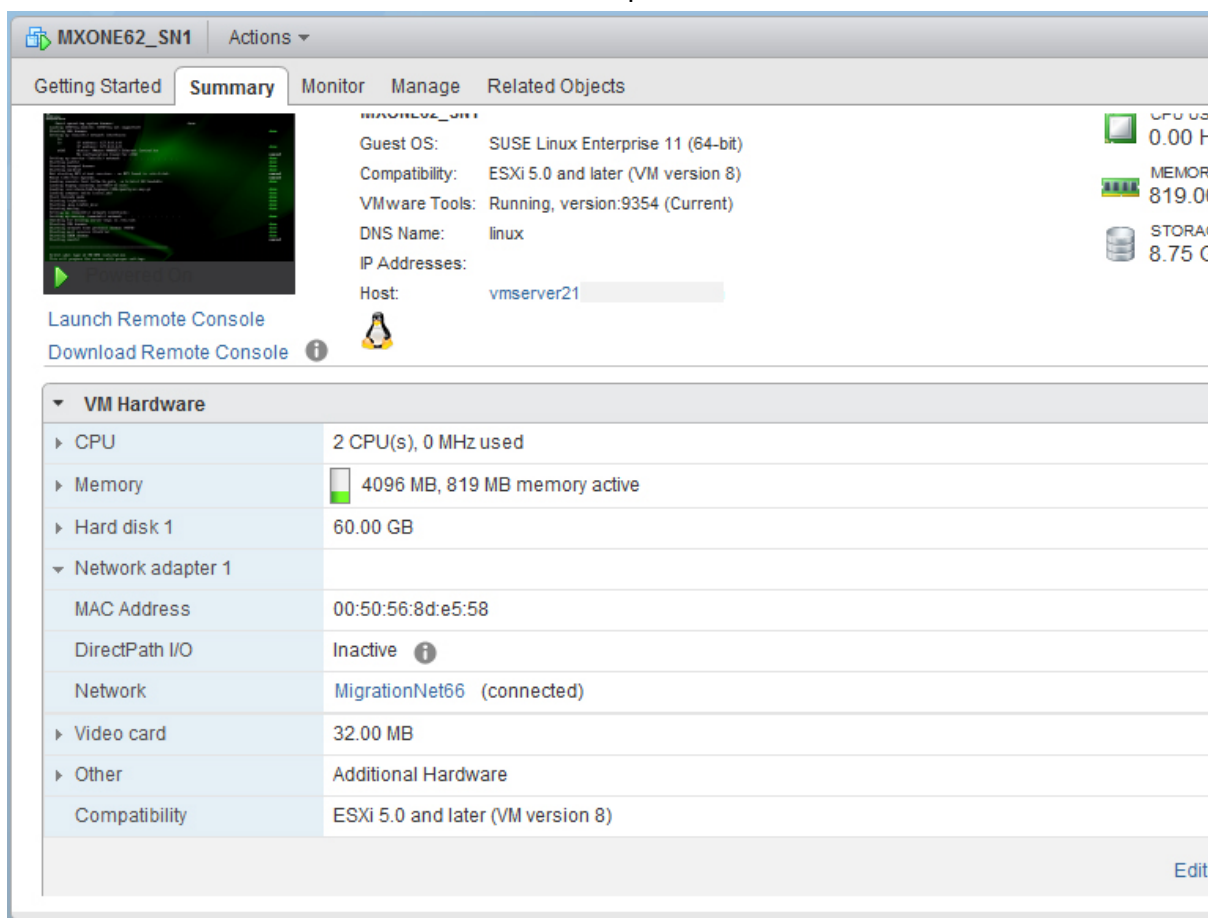
6. Deploy the OVA for the number of Service Nodes required.

7. Adjust the VMs resources (vCPU, memory, disk, and so on) according to the MX-ONE virtualization guidelines. As an example, in this document the process is done 4 times, 3 for Service Nodes and 1 for Provisioning Manager standalone.

    NOTE: MX-ONE requires access to Default Gateway during the installation process.

If the MX-ONE system network consists of only one subnet, a VM PC (it might be the same PC used to setup the system) can be used to simulate the Default Gateway. So, it can be placed in the Migration network with the IP address of the default gateway (DG).

Otherwise, the VMware Administrator needs to setup a valid Default Gateway in the Migration network.

Service Node setup gets fail if it cannot reach the DG by these two ways, because when setup the Service Node network, it tries to PING the default gateway. If the PC is set with the DG IP address, or the network answer, Service Node receives an answer that the operation is succeeded.

For example, default Gateway is 192.168.66.1, the VM PC is configured with this IP.

8. Access the Service Nodes and setup them according to the documentation.

Figure 4.12: MX-ONE Service Node Installation
Screen

9. When all the Service Nodes are setup, the following screen is displayed.

Figure 4.13: MX-ONE Service Node installation screen (3 Service Nodes)

10. Press **C** to continue the installation. When the installation is finished, the following screen is displayed.

Figure 4.14: MX-ONE Service Node Finish Setup (3 Service Nodes)

11. Execute basic tests in the Service Nodes without placing the configuration. You can do this during office hours without system down time.

12. Create a VMware snapshot for the new system, if desired. It might be useful in some cases.

Setting up Microsoft Hyper-V® for MiVoice MX-ONE

To install a Hyper-V machine instance make sure your system meets the following requirements:
- Installed Windows Server 2008, 2012, or 2016
- Have a Windows License (no other special licenses needed)
- Runs on a Dell and HP server
- Have .vhd and .vhdx format image for installation

Enabling Hyper-V

To enable Hyper-V using a power shell:

1. Open a PowerShell console as Administrator.
2. You can do either of the following:

   - Run the following comand: `Enable-WindowsOptionalFeature -Online -FeatureName Microsoft-Hyper-V -All`

Figure 4.15: Windows
PowerShell
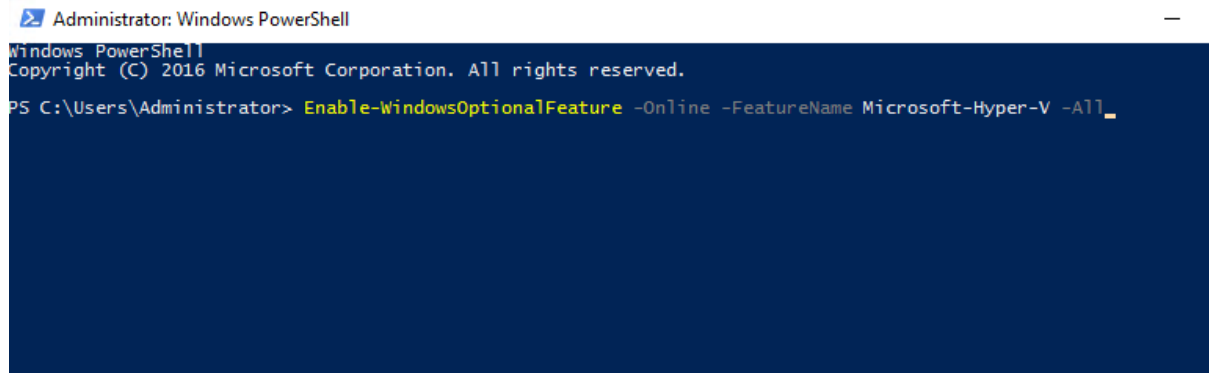
   - Open **Server Manager** and select Server Roles to add role and features and Install Hyper-V

Figure 4.16: Server Manager - Configure Local
Server
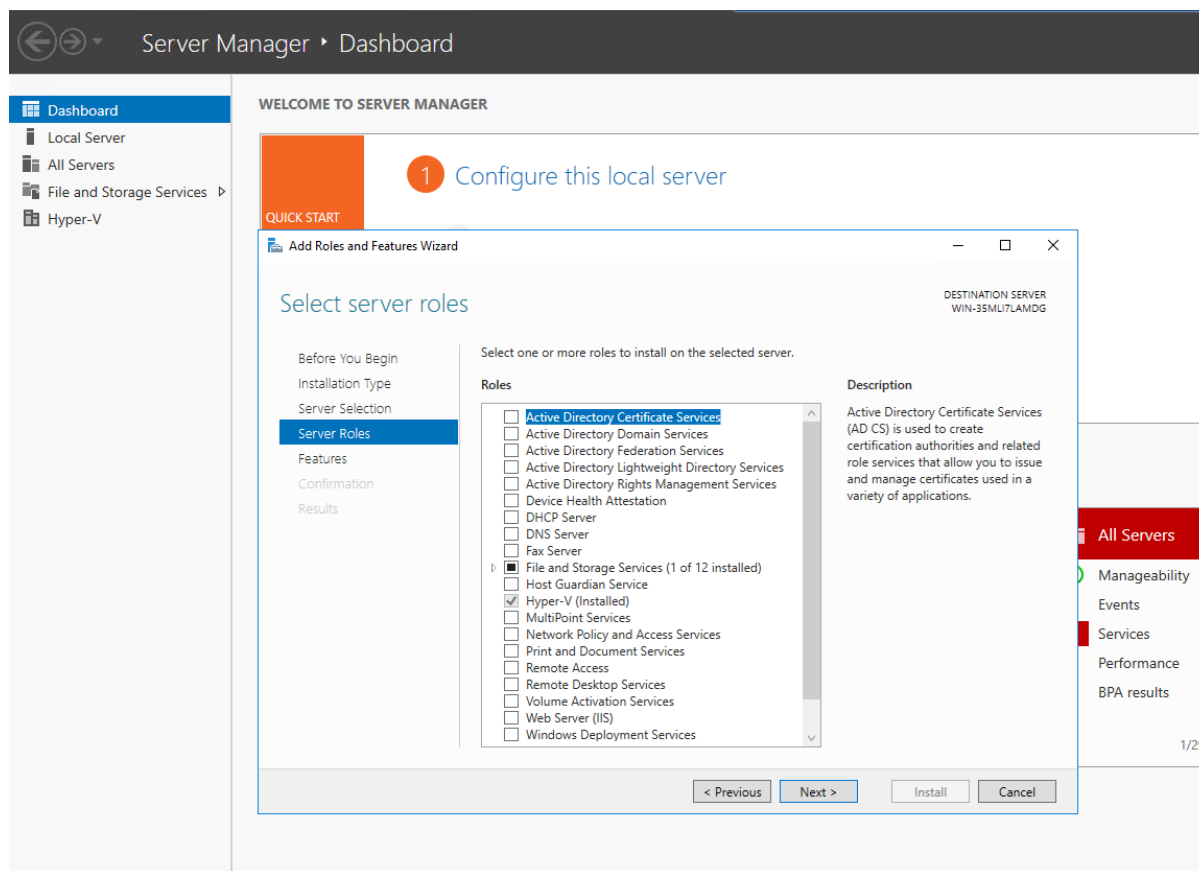
Installing Hyper-V

1. Before you install Hyper-V, create a Virtual Switch Manager for Hyper-V to give network access to the virtual machines.

    a. Select **Virtual Switch Manager**.

Figure 4.17: Virtual Switch
Select
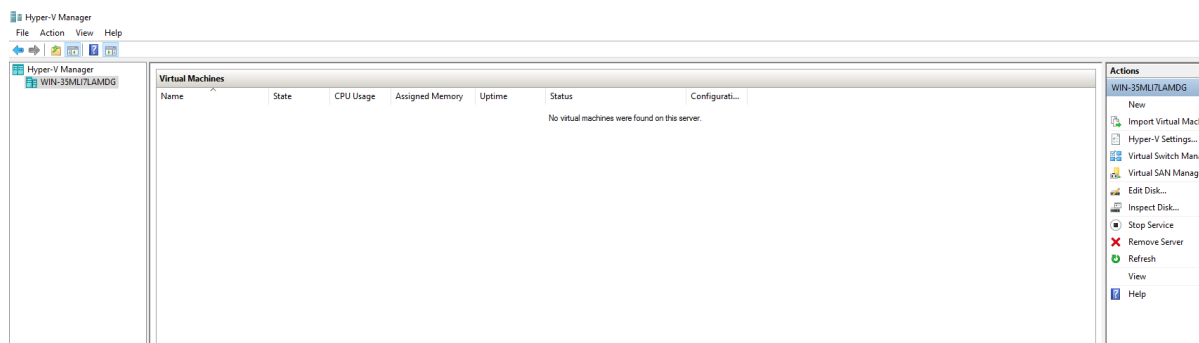
    b. Select type of switch, **External** Switch.

Figure 4.18: Switch
Type
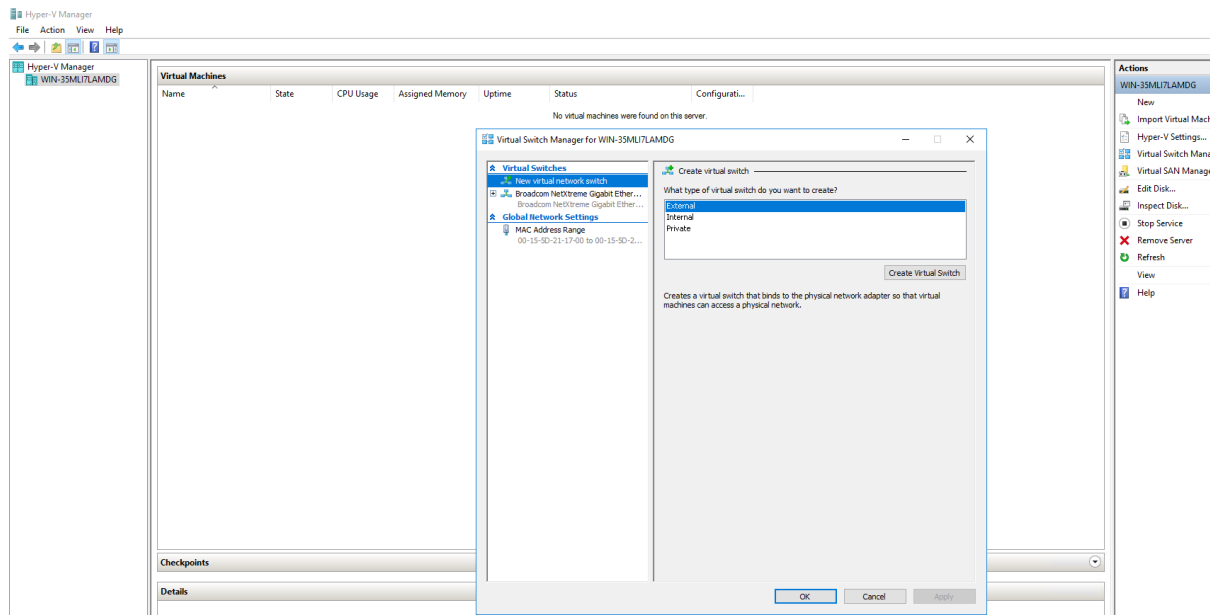
c. Enter the name to the switch and click **Apply**.

Figure 4.19: Switch
Name
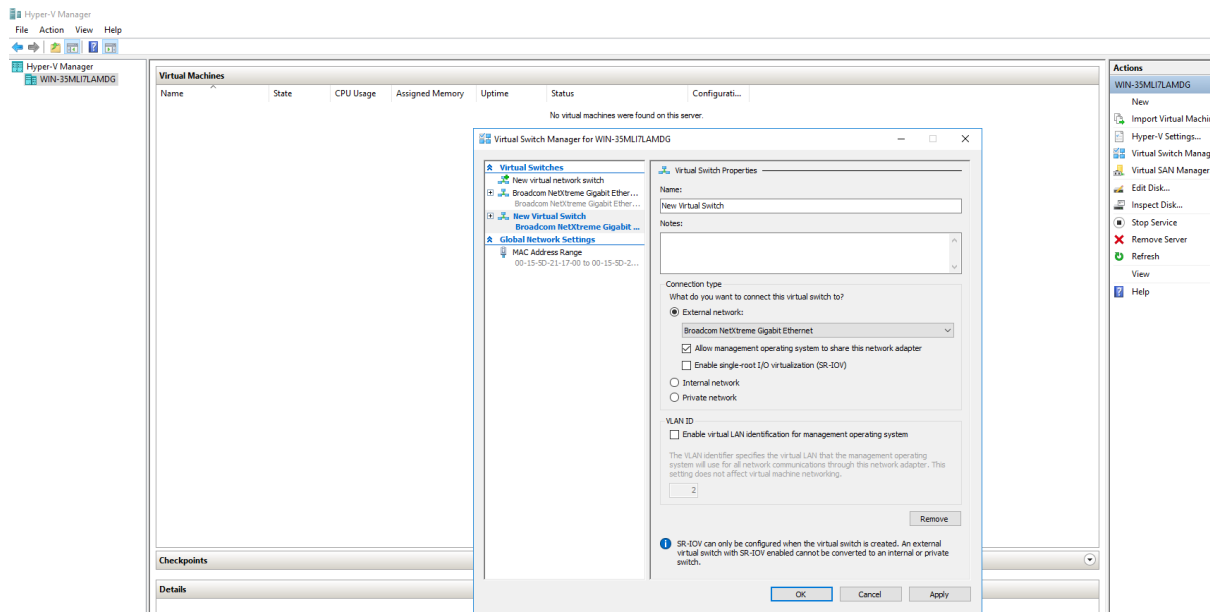
d. Go to `Control Panel > Network Internet > Network Connections` to view the new virtual manager that you created in the above step.

Figure 4.20: Network
Connections
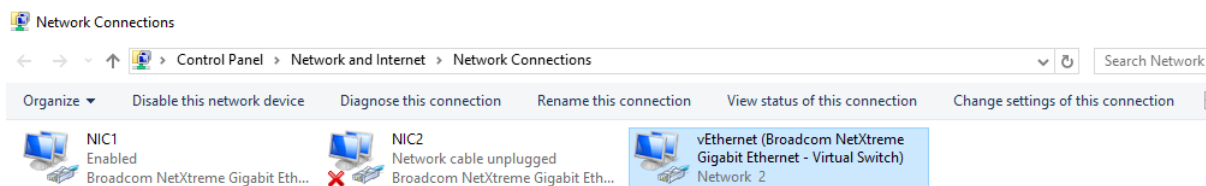
2. Create a Virtual instance:

    a. Select **New** > **Virtual Machine**.

Figure 4.21: Virtual Machine -
New
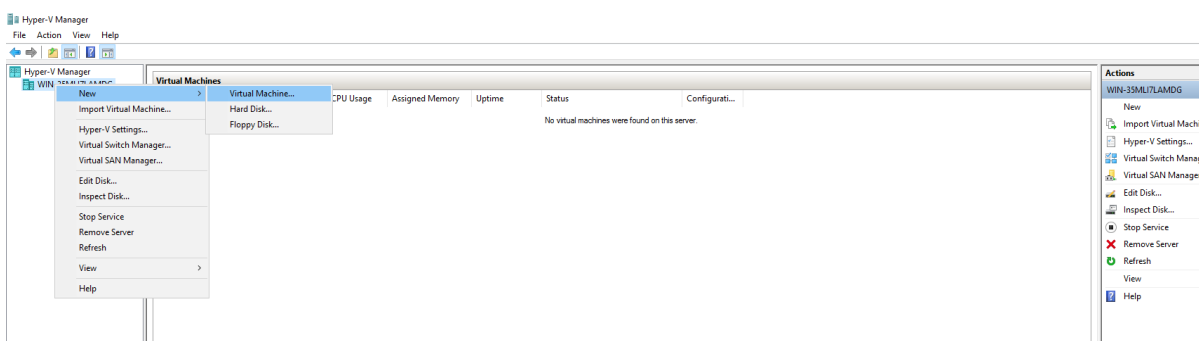
    b. Enter the name of the virtual instance.

Figure 4.22: Specify VM Name and
Location
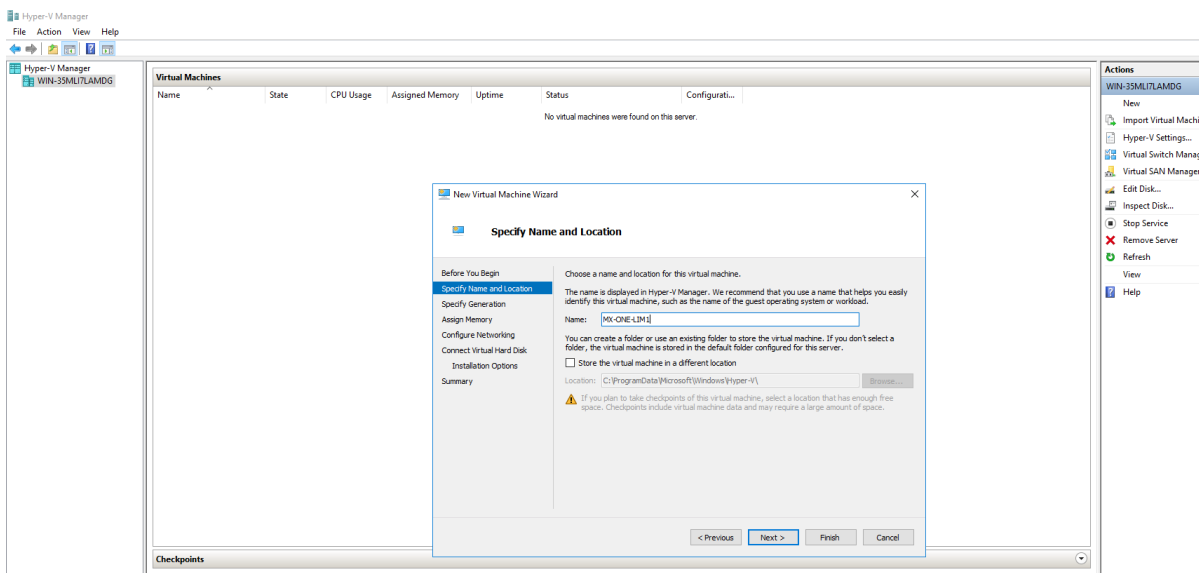
    c. Assign the memory required for the virtual instance.

Figure 4.23: Assign
Memory
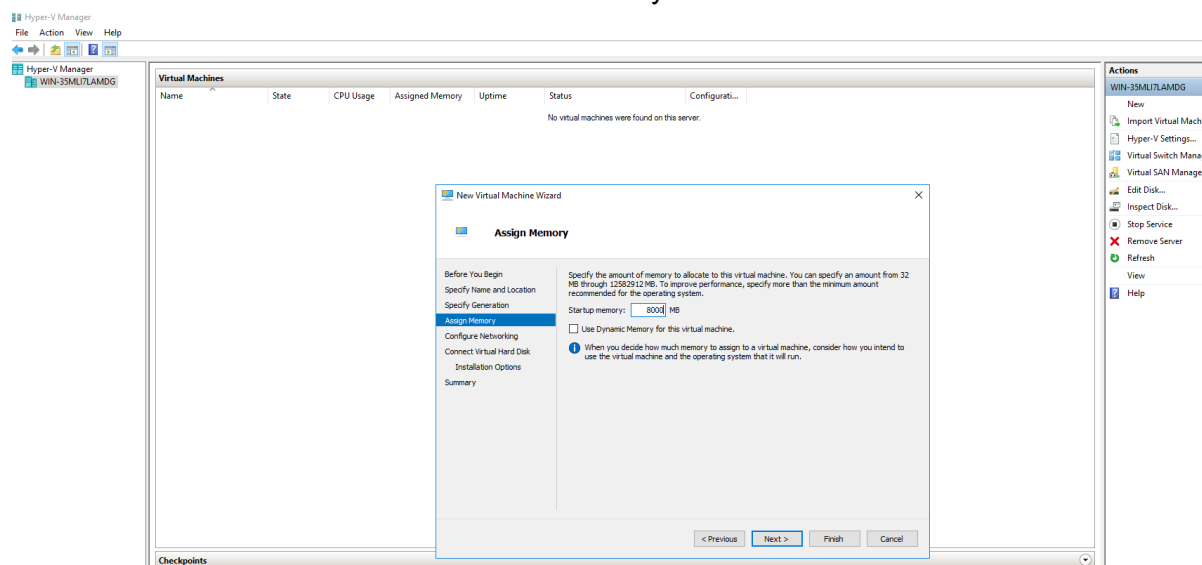
d. Select the network switch that you configured initially.

Figure 4.24: Network
Selection
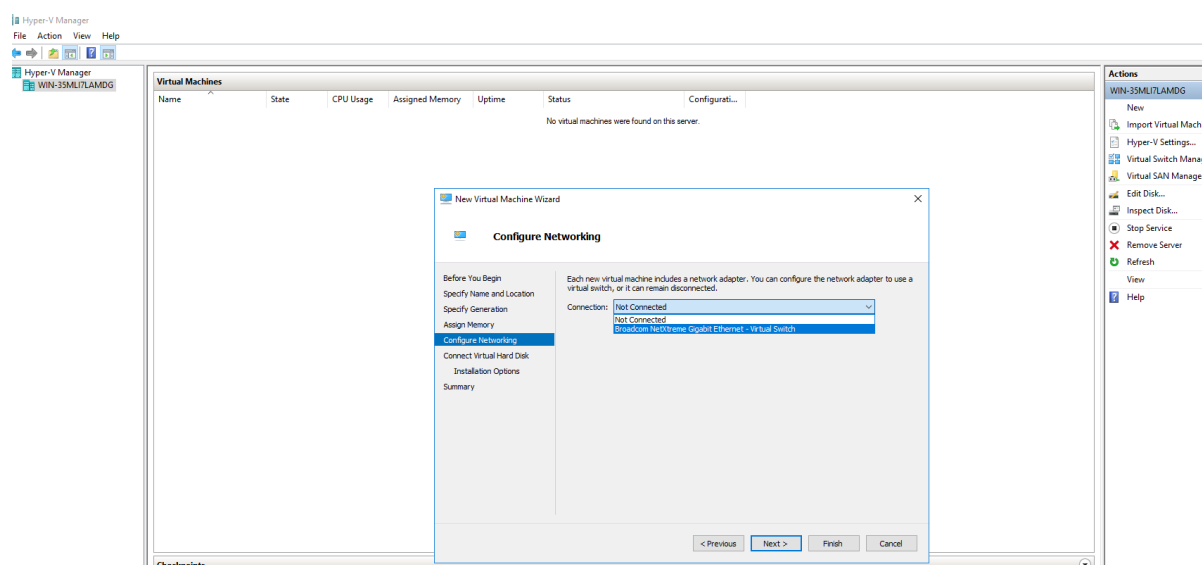
e. Select the image (VHD). Use an existing virtual Hard disk and select the location where your VHD image is stored. For MX-ONE, unzip the Hyper-V image and select the Virtual Hard Disk.

Figure 4.25: Image
Selection_1
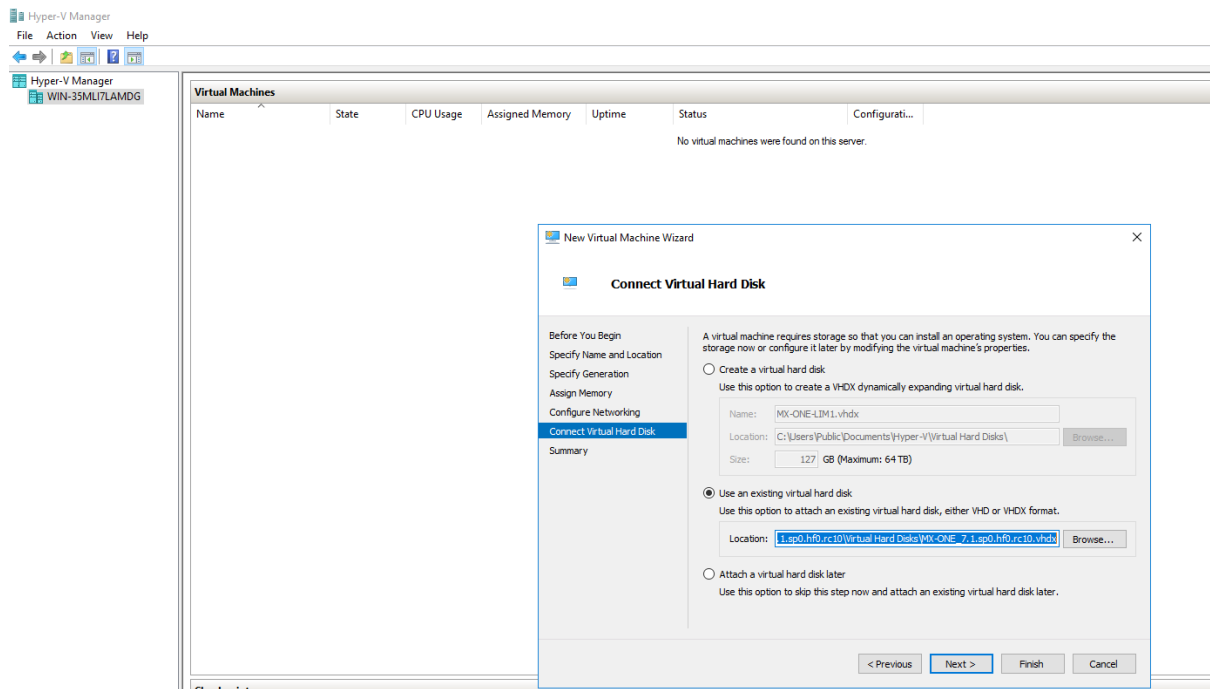
Figure 4.26: Image
Selection_2
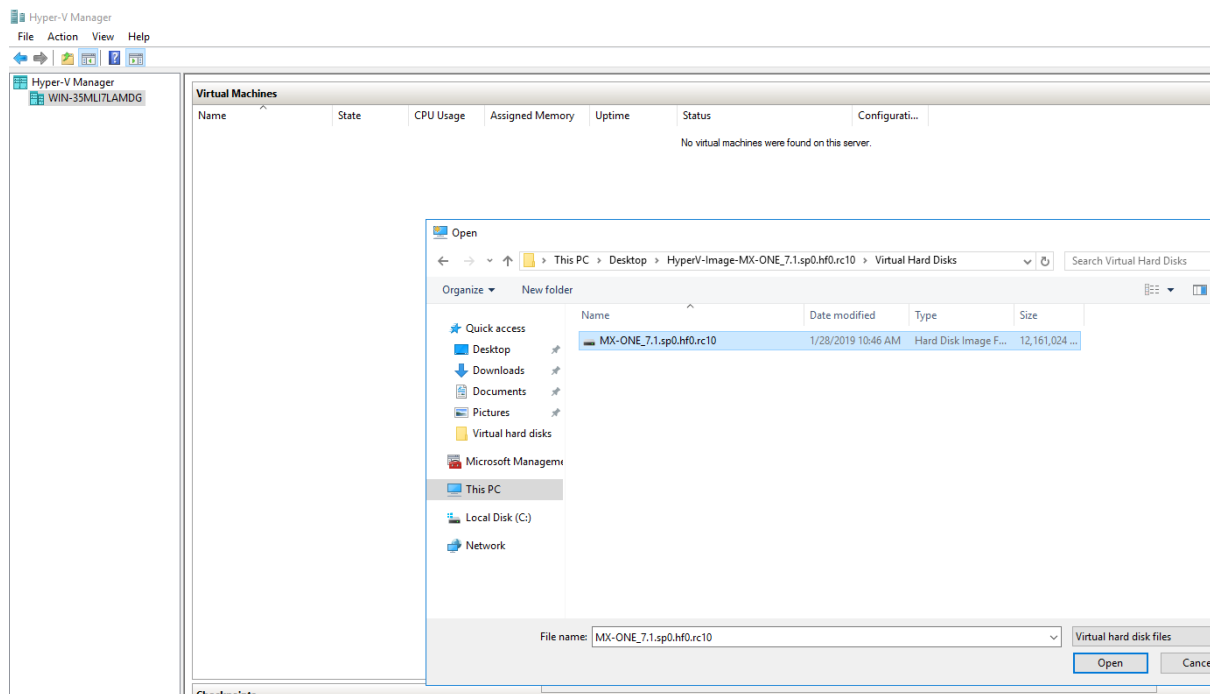
f. Review the summary of the configuration details and click **Finish**.

Figure 4.27: Review
Summary
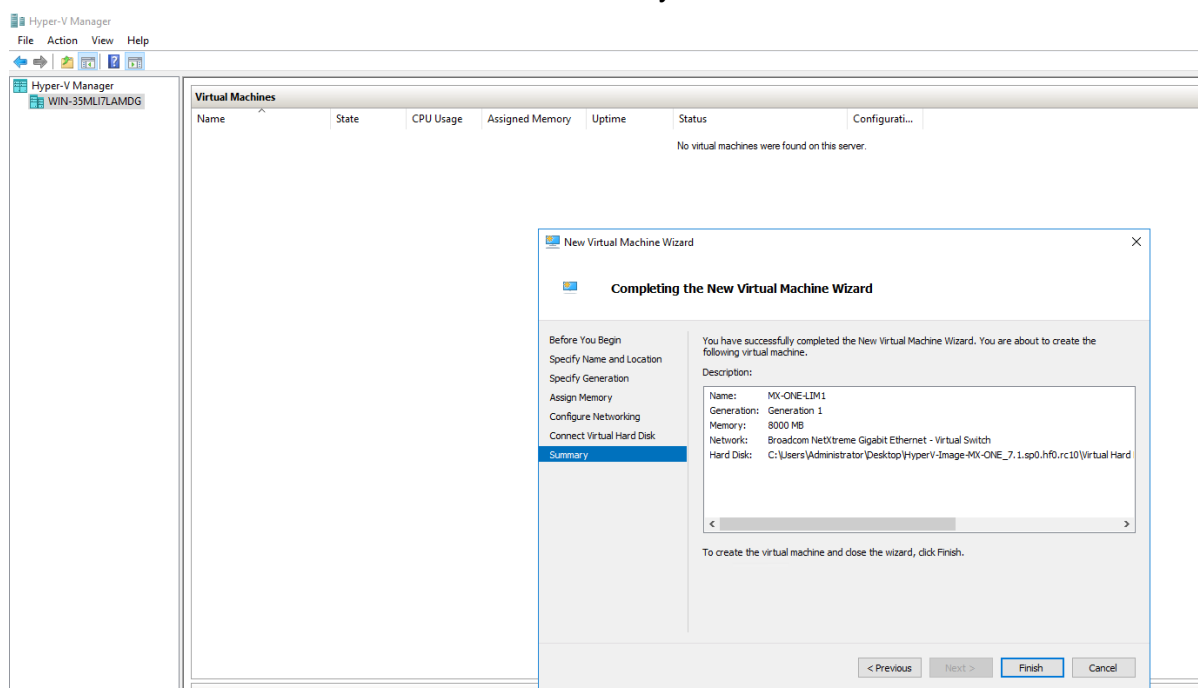
3. Change virtual machine settings as per the requirement.

Figure 4.28: Change VM
Settings
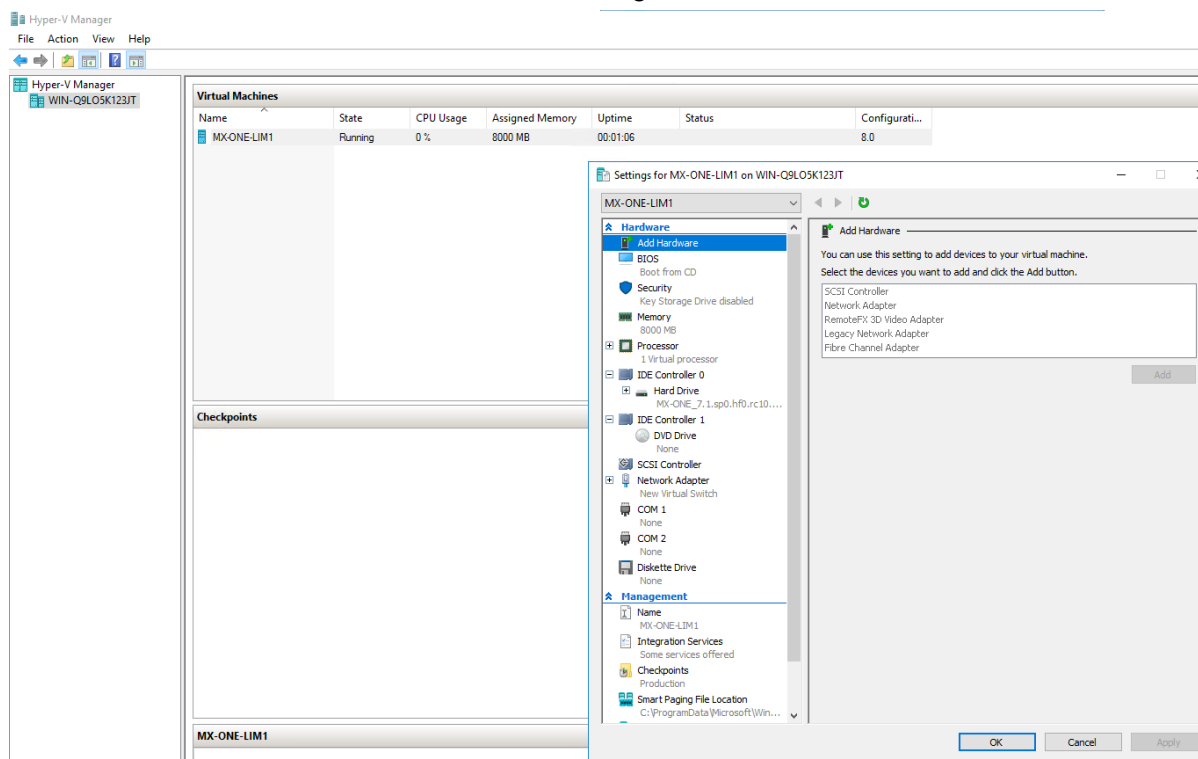
4. Start the virtual machine.

Figure 4.29: Select
VM
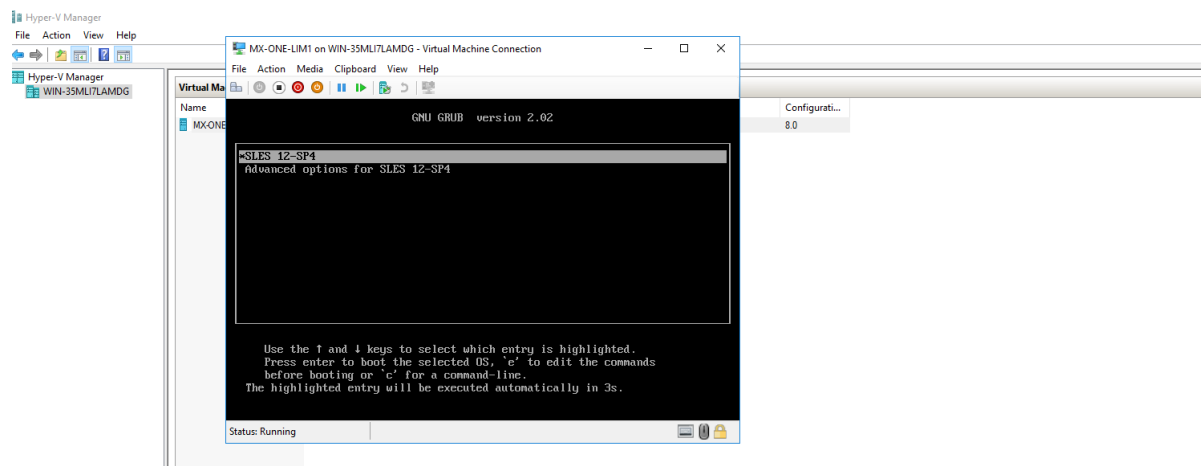
5. Install MX-ONE on the virtual machine instance:

   a. Click **Yes** to configure the MX-ONE server.

Figure 4.30: MX-ONE Initial
Setup
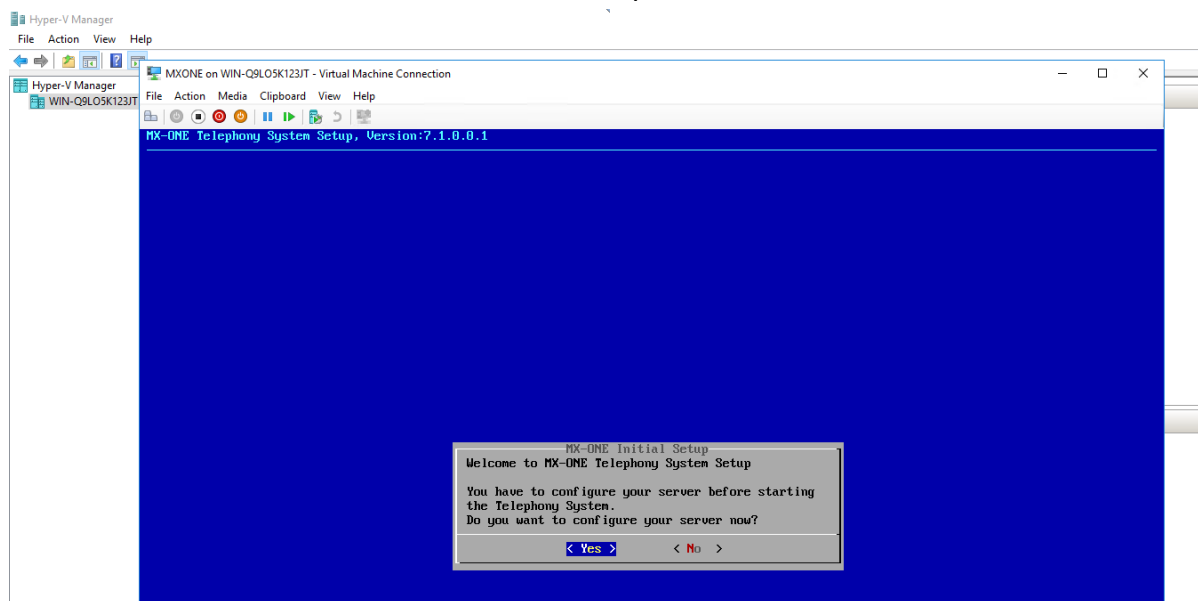
   b. The network service restarts:

Figure 4.31: Network service restart
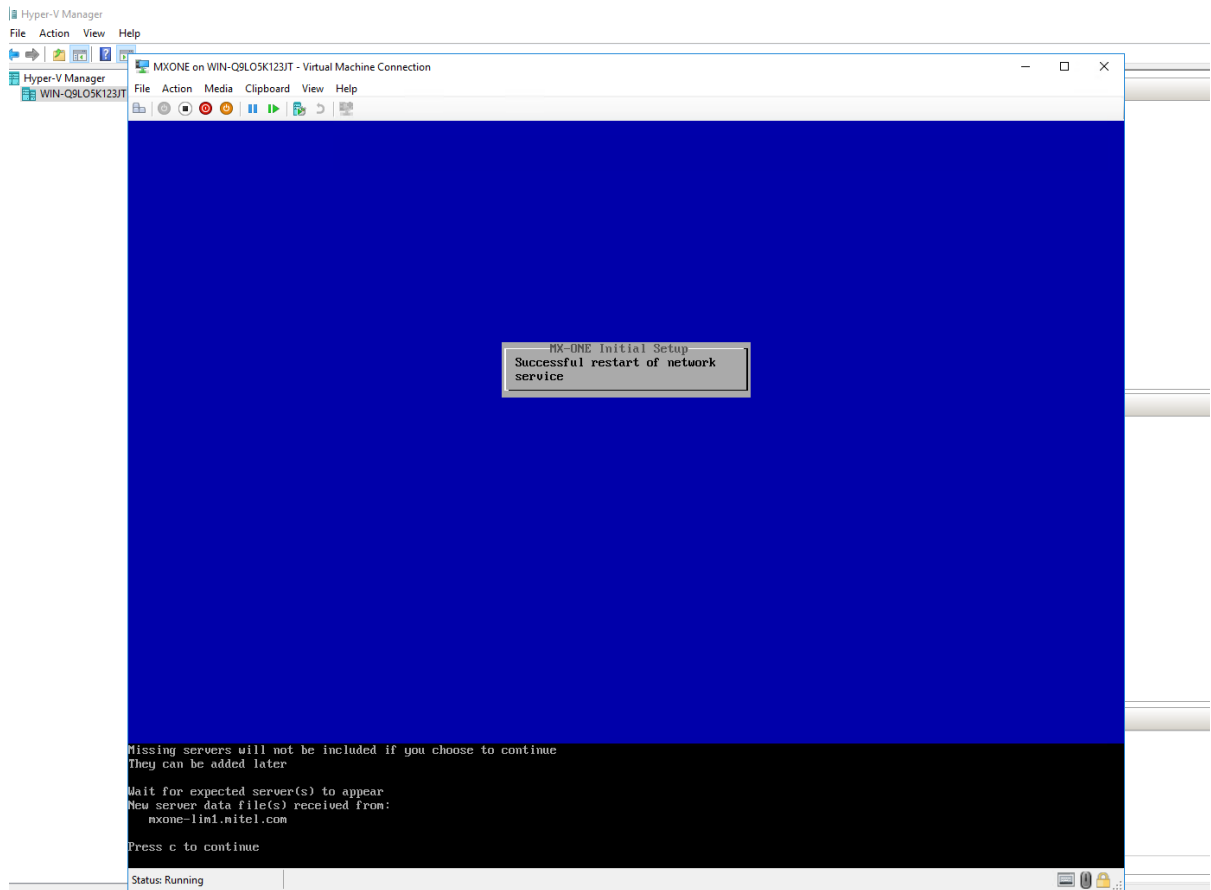
Figure 4.32: MX-ONE Setup
Complete

Standard Infrastructure

The standard infrastructure needs to be in place. The main activities are:

- Creation of the two new networks, Migration and Shadow (it is not mandatory in this case).
- Deploy MiVoice MX-ONE.

Network Setup

In the standard infrastructure, the Migration and Shadow networks are created in an isolated switch in the customer or partner network.

Figure 4.33: Standard Environment Upgrade
(before)
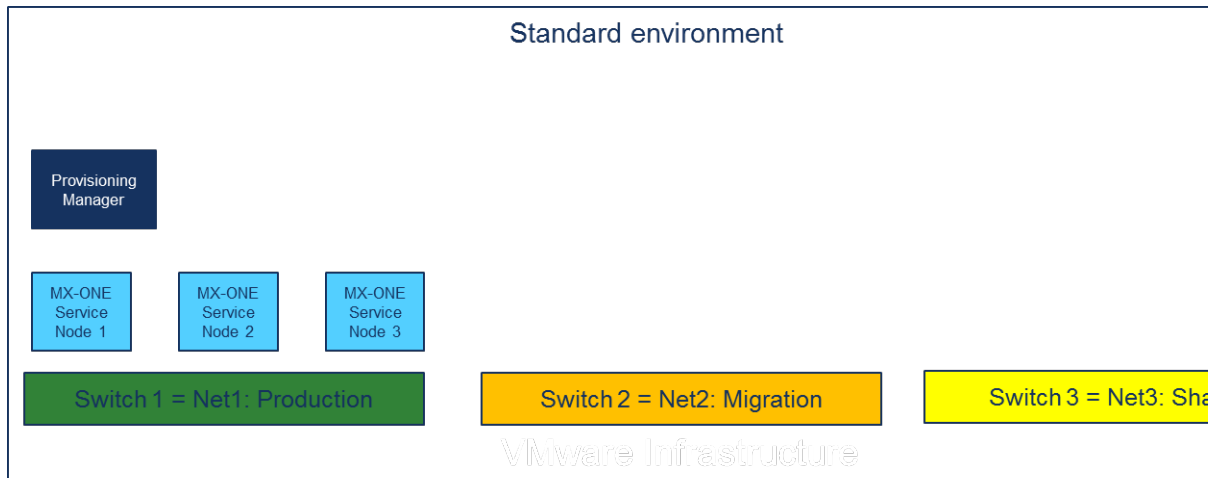
Deploy MiVoice MX-ONE

To deploy MiVoice MX-ONE, do the following:

1. Create the number of Service Nodes required based on size of the current MX-ONE system.

2. Consider consolidation of server/Media Gateways to reduce footprint.

3. Install the new MX-ONE following standard MX-ONE installation documentation.

4. Configure required functionalities for the specific customer. For example, synchronization between the Service Nodes.

5. Execute basic tests in the Service Nodes without placing the configuration. You can do this during office hours without system down time.

> **NOTE:** When a PC is connected to the systems, it access both Production and Migration network.

Figure 4.34: Standard Environment New System Deployed
(after)
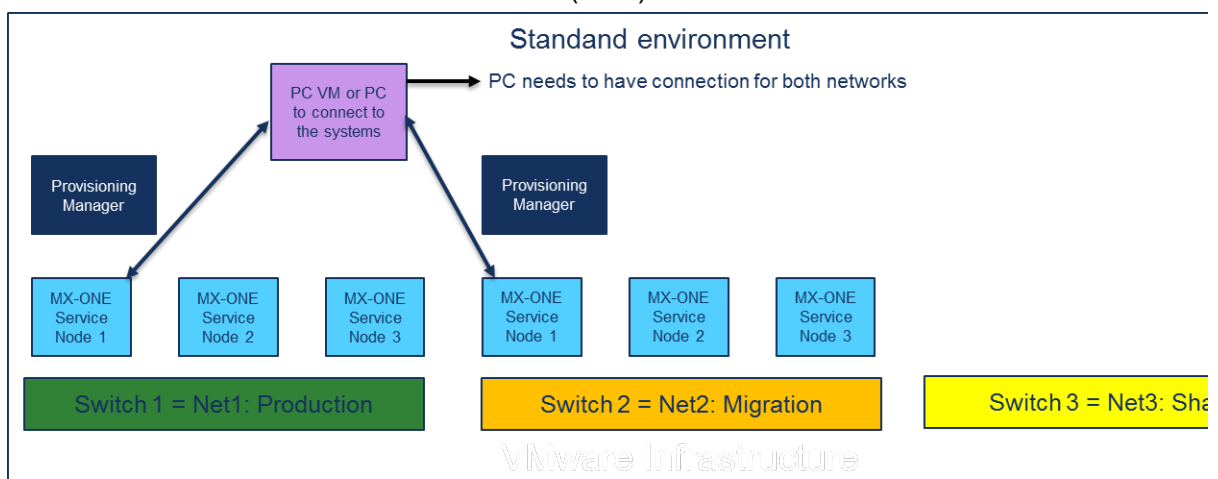
PC-Regen

PC-Regen is a MX-ONE tool used to collect the current customer data. A PC-Regen from the system that is going to be upgraded needs to be done.

Consult your PC-Regen in MX-ONE CPI documentation in order to execute the steps below.

Collecting the Current Data

PC-REGEN must be available at the customer site or must be connected remotely (if that is allowed by the customer) to read/fetch the current customer data.

This is done during office hours without no system down time.

NOTE: When the PC-Regen is collected and the customer constantly does MAC (Move, Add and Change) in the system, it is recommended that the changes stored in a file must be sent to the system afterwards.

Figure 4.35: PC-Regen
Setup
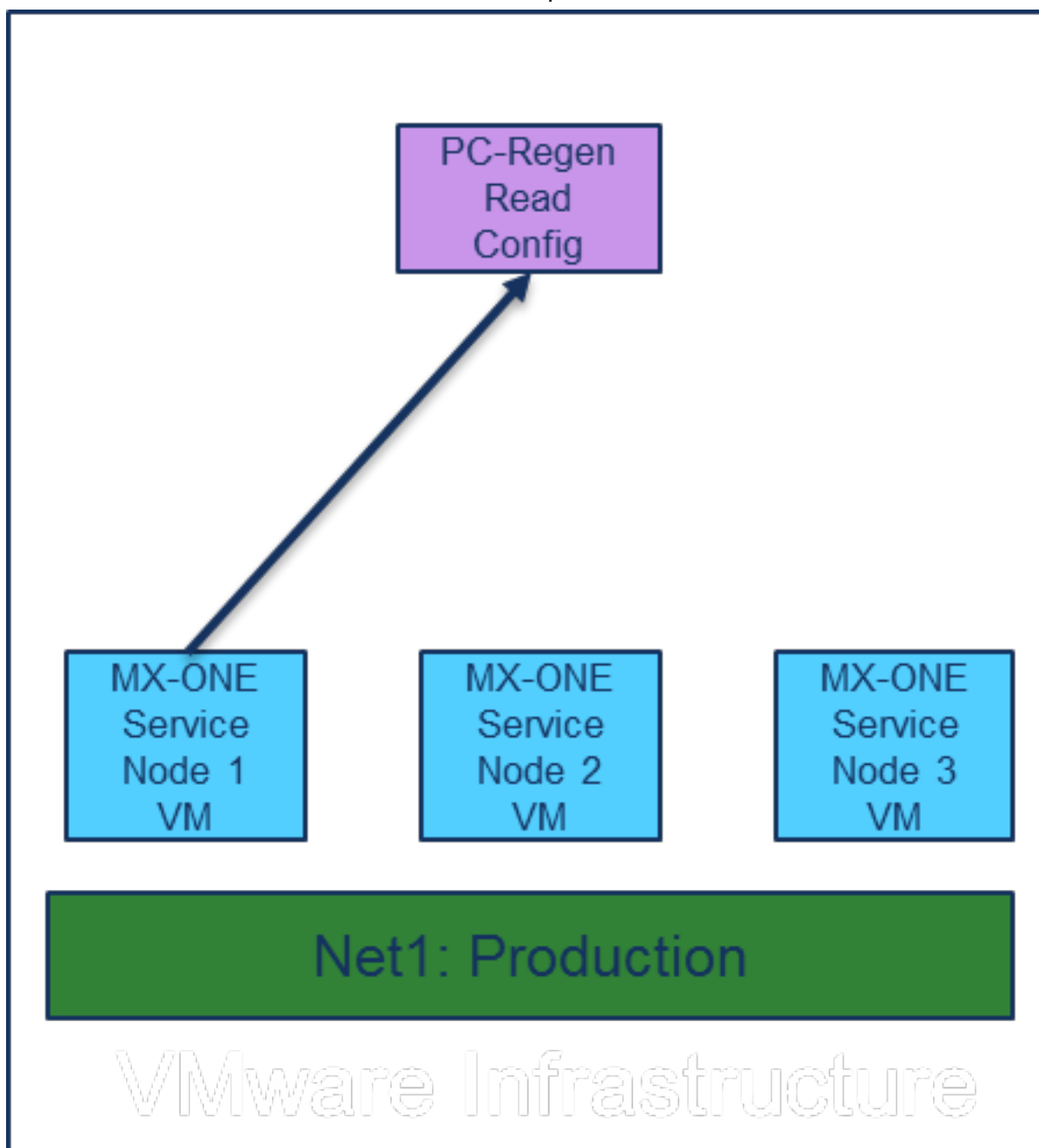
Send the Data to the New System

The collected data is regenerated via PC-Regen. Send the configuration files to MX-ONE as per the
MX-ONE CPI documentation.

NOTE: Disable the security check if a considerable amount of data is sent to the system. Depending of the
system size this activity can take hours or days. Sometimes, the PC-Regen of a system with 12000 users

are sent over the weekend. See the *MiVoice MX-ONE Administration Guide, Chapter 13, Server Hardening*.

When the system setup is completed, execute MX-ONE backup and a VMware snapshot, if desired. This is done during office hours without no system down time.

Figure 4.36: PC-Regen File Send Process (to the new system)
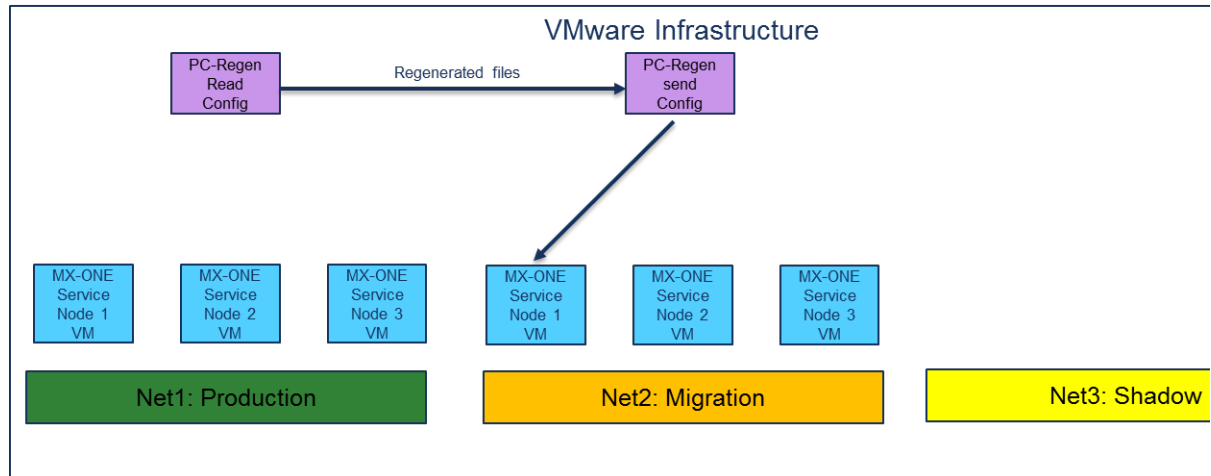
Media Gateway and Media Server Setup

If old hardware is replaced by new chassis with MGU (recommended scenario), update the MGUs if they are not with the latest software. This procedure is not described in this document, refer the *MX-ONE CPI* documentation.

If the customer is using Media Server, then install and configure it. And to follow the procedure, refer the *MX-ONE CPI* documentation.

Execute all tests required in the new system. This work is done during office hours – no down time.

Figure 4.37: Environment with Media Gateways
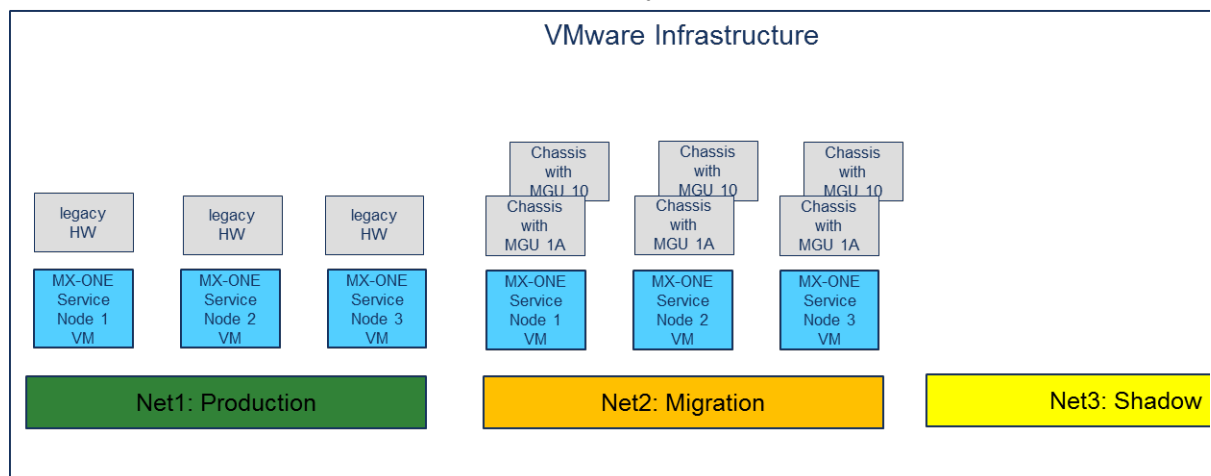
Migrating Provisioning Manager and Service Node Manager

To migrate Provisioning Manager and Service Node Manager, the database backups are required.

For more information, see *Chapter 5, UPGRADING OR UPDATING TO MIVOICE MX-ONE 7.X, Installation Instruction document*.

Backup Service Node Manager (Manager Telephony Server in MX-one 5.0)

To backup Service Node Manager database in the MX-ONE 5.0 SP7, execute the following:
1. Make sure that you are logged in as root.
2. Create a folder. For example, `/home/eri_sn_admin/TSBackup/`

3. Change the permission to allow postgres to write in the folder, such as chmod 757 /home/eri_sn_admin/TSBackup.

4. Save all data of WBM database.

    – Run the following command: `su postgres -c "pg_dump -a -D -d WBM -f /home/eri_sn_admin/TSBackup/wbm_data_only.sql"`
    – It may be necessary to enter the password for the database, which by default is default in MX-ONE 5.0.

5. Save all data of QoS Database and run the following command: `su postgres -c "pg_dump -U postgres QoS -f /home/eri_sn_admin/TSBackup/QoS_entire_data.sql -C --inserts"`

6. Enter the password for the database, which is default in MX-ONE 5.0.

7. Copy the created files to an external media, for example a USB memory, or another safe location.

Template Data Backup

1. Ensure that you are logged in as root on the Manager Telephony System Server.
2. Run the following command to archive the templates: `"tar -cf customer.tar --directory=/opt/jboss/server/default/conf/templates"`

3. Copy the customer.tar file to an external media. For example, to a USB memory.

Backup Provisioning Manager (Manager Provisioning in MX-ONE 5.0)

If Provisioning Manager and Service Node Manager are installed on the same server or on different servers, the data for Provisioning Manager must be saved. Because, upgrading Service Node Manager clears the database that is used by Provisioning Manager.

To backup Provisioning Manager database in the MX-ONE 5.0 SP7, execute the following:
1. Logon on Manager Provisioning server as root.
2. Create a Folder /home/eri_sn_admin/TSBackup/ if it does not exist. Such as, mkdir -p /home/eri_sn_admin/TSBackup/

3. Enter the command `mp_config` and select **Database backup**.

Figure 4.38: Manager Provisioning mp_config
Utility
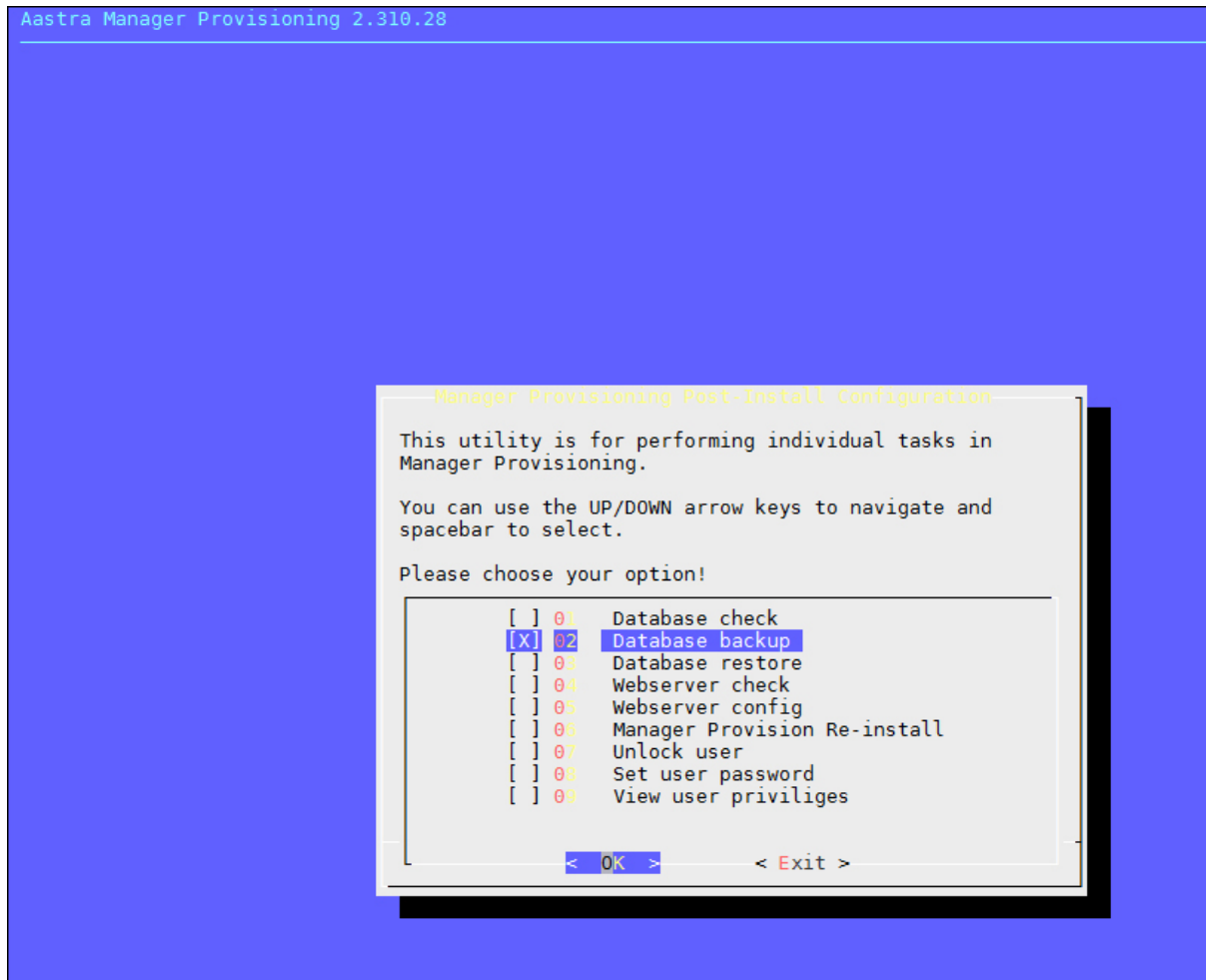
4. Backup MP database is stored in directory /var/opt/mxone_pm_config/ with a file name starting with "mpManagerPostgresDump" followed by date, rpm version and release details.

Figure 4.39: Manager Provisioning Backup
Result

5. Save all data of Quartz Database using the following command: `su postgres -c "pg_dump -a -D -d Quartz -f /home/eri_sn_admin/TSBackup/Quartz_data_only.sql"`

6. Enter the password for the database, which is default in MX-ONE 5.0.

7. Copy the created files (or the entire directory) to an external media, for example a USB memory, or another safe location.

Manager Provisioning Template Data Backup

1. Ensure that you are logged in as root on the Manager Provisioning Server. This is useful when the Manager Provisioning is in different server (standalone).
2. Run the following command to backup the templates: `tar -cf customer_mp.tar --direc-tory=/opt/jboss/server/default/conf/templates`.

3. Copy the customer_mp.tar file to an external media, for example an USB memory.

Restore Service Node Manager

NOTE: Before executing this step, first restore MX-ONE data by using PC-Regen. Ensure that the required resources to the Service Node Manager are in place. Adjust the Jboss heap memory of the server according to the Service Node Manager. To do this, refer the Service Node Manager Installation document in MX-ONE CPI.

To restore Service Node Manager, do the following:
1. Go to the new Service Node Manager installed in the Service Node 1.
2. Copy the Manager Telephony System's data files (wbm_data_only.sql, QoS_entire_data.sql, customer.tar) to /home/eri_sn_admin/TSBackup Directory.

3. Provide the 755 permissions to these files.

4. Execute the snm_upgrade script then follows the instructions. This script restores WBM, QoS and customer.tar (customer templates) to the system.

Restore Provisioning Manager

NOTE: Restore Service Node Manager before restoring Provisioning Manager in case of Co-existence system. The Provisioning Manager in this example has 23 K users that were synchronized via Active Directory with the MX-ONE 5.0. The system has 15 K SIP extensions. So, this requires a Provisioning Manager standalone.

Figure 4.40: Restore Service Node
Manager

```
MXONE-MMM-SN1:/local/home/mxone_admin/TSBackup # snm_upgrade
The 5.x to 6.x data restore Process Needs Restart of PostgreSQL Database and PM/SNM/CSTAPhaseIII app
 Do you still want to Continue to Restore the Data [YES/NO]
yes

Restoring previous data to Service Node Manager...

Current RPM Version 6.2.0.0.9.479
Current RPM Release 201611031016
customer/
customer/AccountCode/
customer/AnalogueExtension/
customer/AuthorizationCode_AUCOP/
customer/AuthorizationCode_IndAUCOP/
customer/CommonAbbNum/
customer/Csp/
customer/Fax/
customer/HuntGroup/
customer/HuntGroupMember/
customer/IPExtension/
customer/IPFunctionKey/
customer/IPPhoneConfigFile/
customer/MobileExtension/
customer/PersonalNumber/
customer/PickupGroup/
customer/Route/
customer/VirtualExtension/
customer/TelephonyServer/
customer/TelephonyServer/IP-template_4_IPExtension/
customer/TelephonyServer/IP-template_4_IPExtension/TemplateInfo.xml
customer/TelephonyServer/IP-template_4_IPExtension/PELCP.xml
customer/TelephonyServer/IP-template_4_IPExtension/GEDIP.xml
customer/TelephonyServer/IP-template_4_IPExtension/GEADP.xml
customer/TelephonyServer/IP-template_4_IPExtension/IPEXP.xml
customer/TelephonyServer/IP-template_4_IPExtension/NIINP.xml
customer/TelephonyServer/IP-template_4_IPExtension/PELPP.xml
customer/TelephonyServer/IP-template_4_IPExtension/PNNames.xml
customer/TelephonyServer/IP-template_4_IPExtension/SUSIP.xml
customer/TelephonyServer/IP-template_4_IPExtension/GEFKP.xml
...Restore of data completed.
See /var/log/mxone/eri_om/eri_om_rpm_6.2.0.0.9.479_201611031016_5_0_to_6_0.log
Starting the Application....
Starting eri_jboss daemon

Unable to Extract Certificates from Key Store
Turning on eri_jboss i.e. the web engine for java applications.
JBoss start up in progress.......
To see progress, use:
tail -f -n 0 /opt/jboss/server/default/log/eri_jboss.log /opt/jboss/server/default/log/server.log
MXONE-MMM-SN1:/local/home/mxone_admin/TSBackup #
```

To restore the backup in Provisioning Manager, execute the following:

1. Copy the Manager Provisioning data files (mpManagerPostgresDumpxxxxxx, Quartz_data_only.sql, customer_mp.ear) files to /var/opt/mxone_pm_config/ Directory.

2. Make sure that the files are owned by "root" user.

3. Execute `mp_config` and select **Database restore**. The script takes care of restoring PM, Quartz databases and Customer_mp.tar (Customer template) data.

Figure 4.41: Provisioning Manager mp_config
Utility
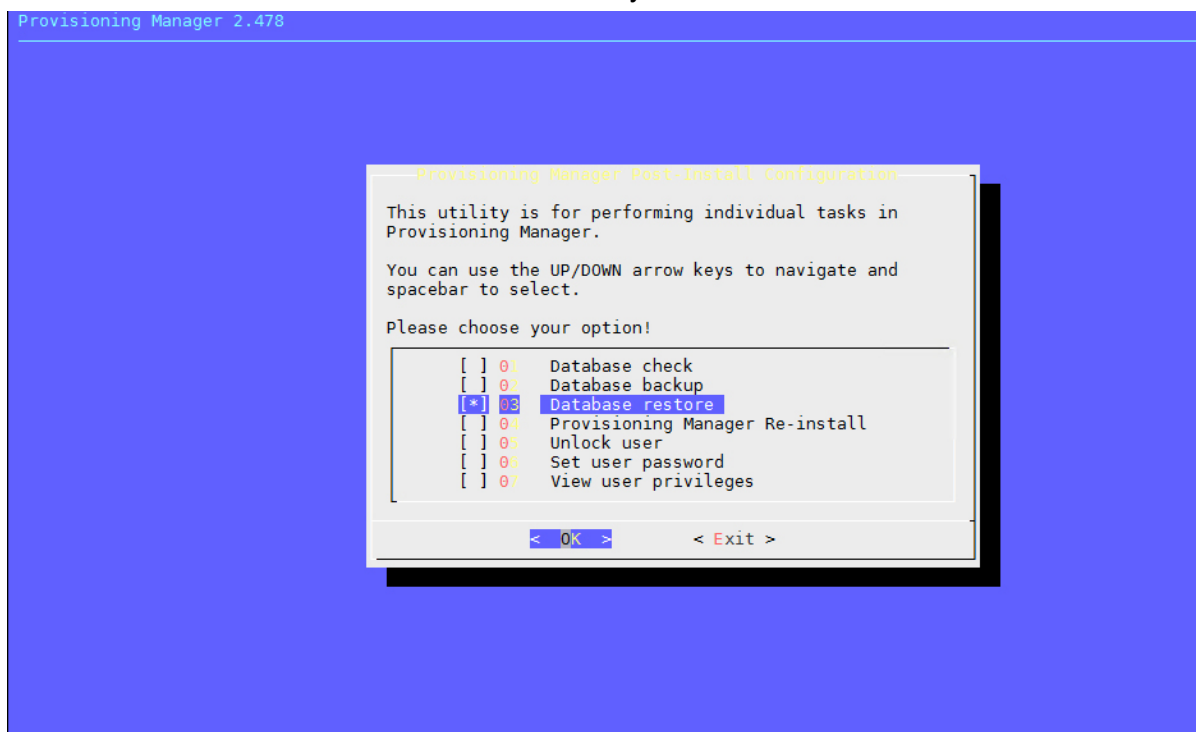
4. Remove the Quartz_data_only.sql and customer_mp.tar from /var/opt/mxone_pm_config directory after data restore.

5. Execute the following command: `cd /var/opt/ mxone_pm_config rm -f Quartz_-data_only.sql customer_mp.tar`.

Verify Provisioning Manager and Service Node Manager setup

After restoring the database, both software needs get verified to execute the sanity check.

Provisioning Manager Details

To view Provision Manager:

1. Login in to the Provisioning Manager and change the administrator password if it is not in compliance with MX-ONE 6.X requirements.

Figure 4.42: Provisioning Manager Page (after restore)

2. Go to user task and check if users are present in the Manager Provisioning 5.0 in the new system. In the Provisioning Manager User task, the first page is presented below showing the first 200 users.

Figure 4.43: User Task (all users page 1)

3. In the Provisioning Manager User task, below is the last page is presented showing the remaining 200 users. In this system 200 users per page, 115 pages, resulting in 23000 users.

Figure 4.44: User Task (all users page 1)

4. Go to user task and add a new administrator user to manager the system (AlaCarte Service Provider).

Figure 4.45: User Task All Users (Page 115)

5. Go to Administrator task and select Administrator and click **Add**.

6. Select the new administrator user and the Security Profile AlaCarte Service Provider, make the other setup and click **Apply**.

Figure 4.46: Add Administrator
Page

7. If the new administrator user is successfully created, the following screen is presented.

Figure 4.47: Add New User
Result

8. If the security profile for new administrator user is successfully assigned, the following screen is presented.

Figure 4.48: Add Administrator
Result

9. Login with the new administrator user, in the example admin_rd.

10. Go to **System menu> Subsystem**, change the **Subsystem** information, **Version** and User ID in **Subsystem.**

Figure 4.49: Subsystem View
Page

11. Subsystem change result is presented below.

Figure 4.50: Subsystem Change
Result

Subsystem - Change - ABS - Result

Done

Change operation successful for:

- **Subsystem Name**: ABS

Property	Value
Subsystem Type	MiVoice MX-ONE
Use HTTPS	No
Subsystem Name	ABS
Version	6.2
IP Address	10.105.66.30
Port	80
User ID in Subsystem	admin_rd
IP Phone Server	
Location	Denver

Change This...   Done

NOTE: In this example Provisioning Manager is used for the Service Node Manager authentication

12. If the setup is correct, the license information is shown as below.

Figure 4.51: Subsystem
Page
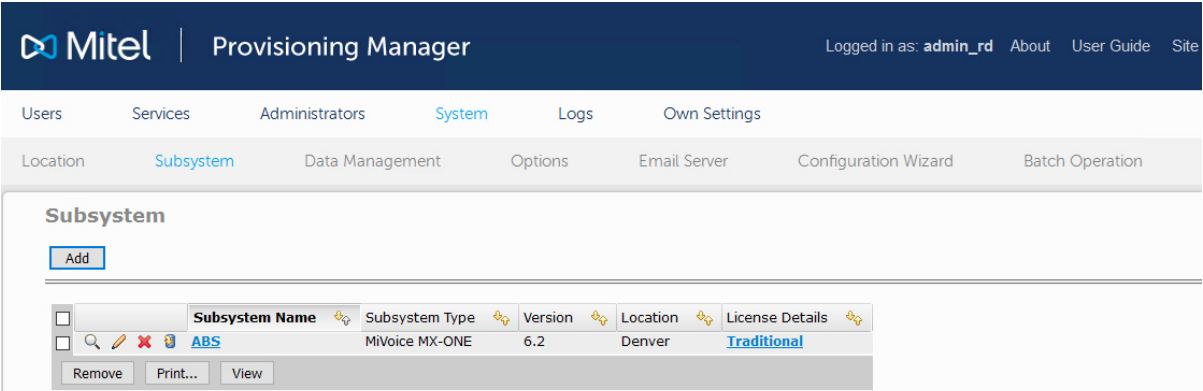
13. Go to User task and select for example first and the last user and check if the extension information is correct.

14. Click in the pencil icon to change or magnifier to view the extension configuration.

Figure 4.52: User Change Service
Summary
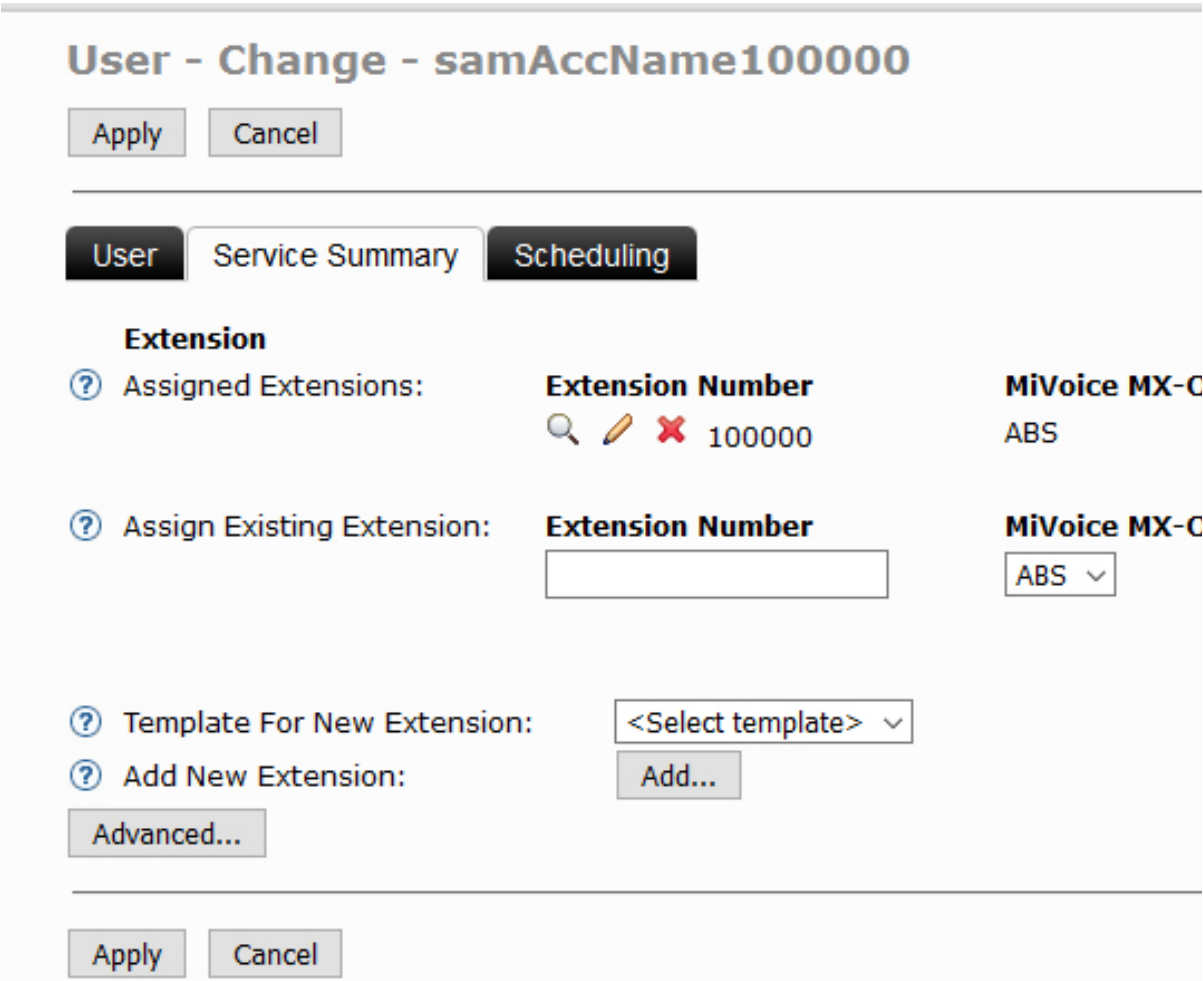
Below the change page is shown for the extension 100000.

Figure 4.53: User change extension
page

Extension - Change - 100000-MultiTerminal-ABS

[Continue] [Cancel]

General

(?) MiVoice MX-ONE: ABS

(?) Extension Number: 100000

(?) Description:

(?) Server Number: 1

(?) Extension Type: Multi-Terminal

(?) Customer: None

(?) Common Service Profile: 2 - (None) ⌄

(?) Phone Language: Default ⌄

(?) Backup Answering Position Number:

(?) Allow Security Exception: ☑

(?) Boss/Secretary: None ⌄

(?) Home Area Code:

(?) DECT Extension: [Add...]

(?) Mobile Extension: [Add...]

(?) IP Extension: ✏ ✖ 100000

(?) SIP Remote Terminal: [Add...]

(?) SIP Auto-registered Terminal: [Add...]

(?) SIP DECT Terminal: [Add...]

Name Identity

(?) First Name: n100000

(?) Last Name: 100000

Authorization Code

(?) Authorization Codes: [Edit...]

✓

Ring Signal

(?) Ring Signals: [Edit...]

Personal Number

(?) Personal Number List: [Edit...]

1: Profile1:Active
5: Profile5:Set

15. Click in the pencil to change or magnifier to view the extension configuration.

Figure 4.54: User Change Service
Summary

16. Below the change page is shown for the extension 122998.

Figure 4.55: User Change Extension
Page

Extension - Change - 122998-IP-ABS

Continue   Cancel

General

(?) MiVoice MX-ONE: ABS
(?) Extension Number: 122998
(?) Description:

(?) Server Number: 2
(?) Extension Type: IP
(?) Customer: None
(?) Common Service Profile: 2 - (None) ⌄
(?) Phone Language: Default ⌄
(?) Backup Answering Position Number:
(?) Allow Security Exception: ☑
(?) Allow EDN: NO
(?) Boss/Secretary: None ⌄
(?) Home Area Code:
(?) Protocol: ○ SIP
                                            ● IP
(?) Free on Second Line: Yes, but can be changed via terminal menu ⌄

Name Identity

(?) First Name:
(?) Last Name:

Authorization Code

(?) Authorization Codes: Edit...

Ring Signal

(?) Ring Signals: Edit...

Personal Number

(?) Personal Number List: Edit...

Logged On Status

(?) Registered Phone Type: NOT REGISTERED

Function Keys

(?) Phone Type: Other type ⌄
(?) Panel Type: No panel ⌄
(?) Function Keys: Change...

17. Go to Subsystem and perform a Service Node backup if it is required.

Figure 4.56: Service Node Backup
Result
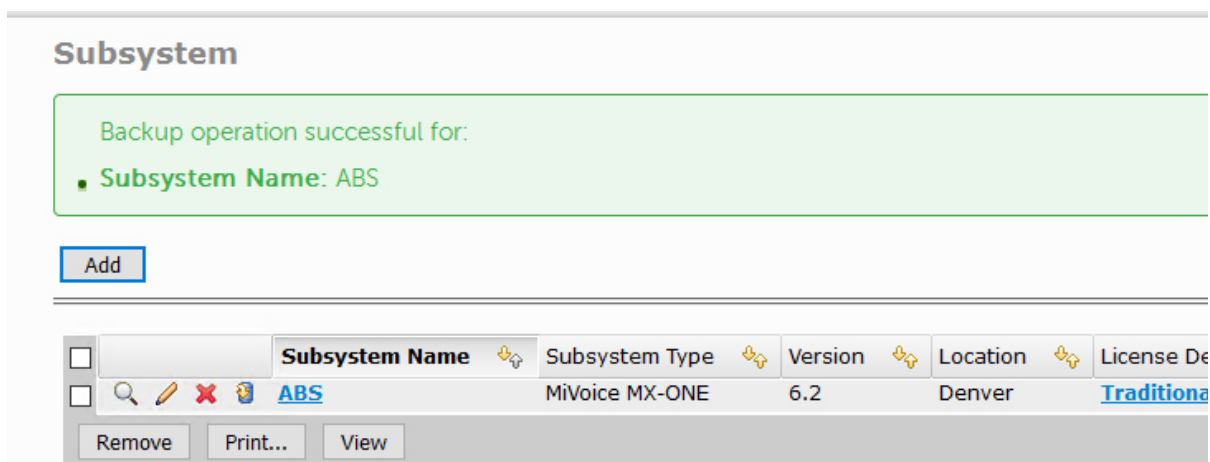
18. Click in the Subsystem Name link to open Service Node Manager.

Service Node Manager

1. Verify the Service Node Manager functionality.

Figure 4.57: Service Node Manager Main
Page
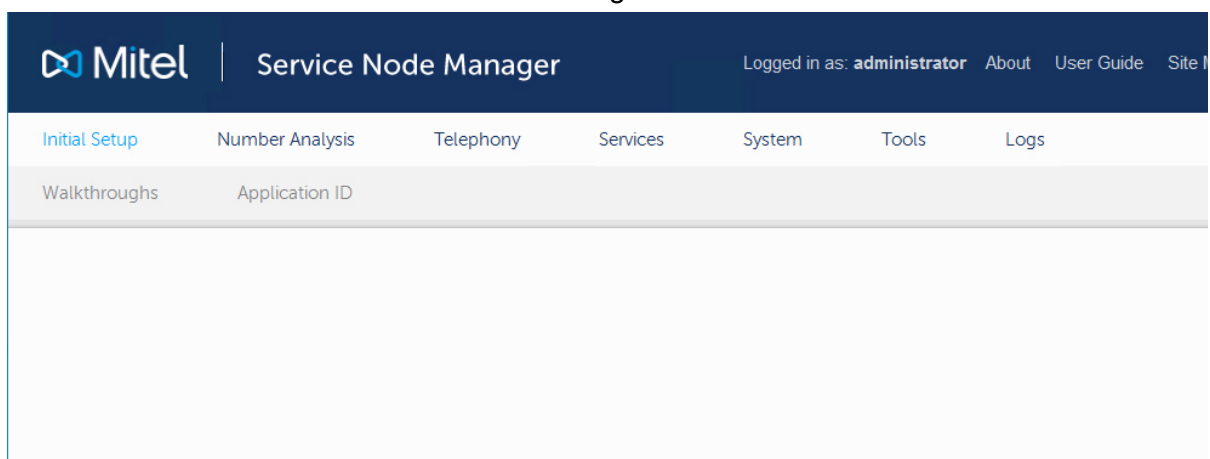
2. Navigate in the tool and check if the configuration is correct.

3. In Telephony menu, click **Groups** and then **Hunt Group**

Figure 4.58: Service Node Manager Hunt Group
Page
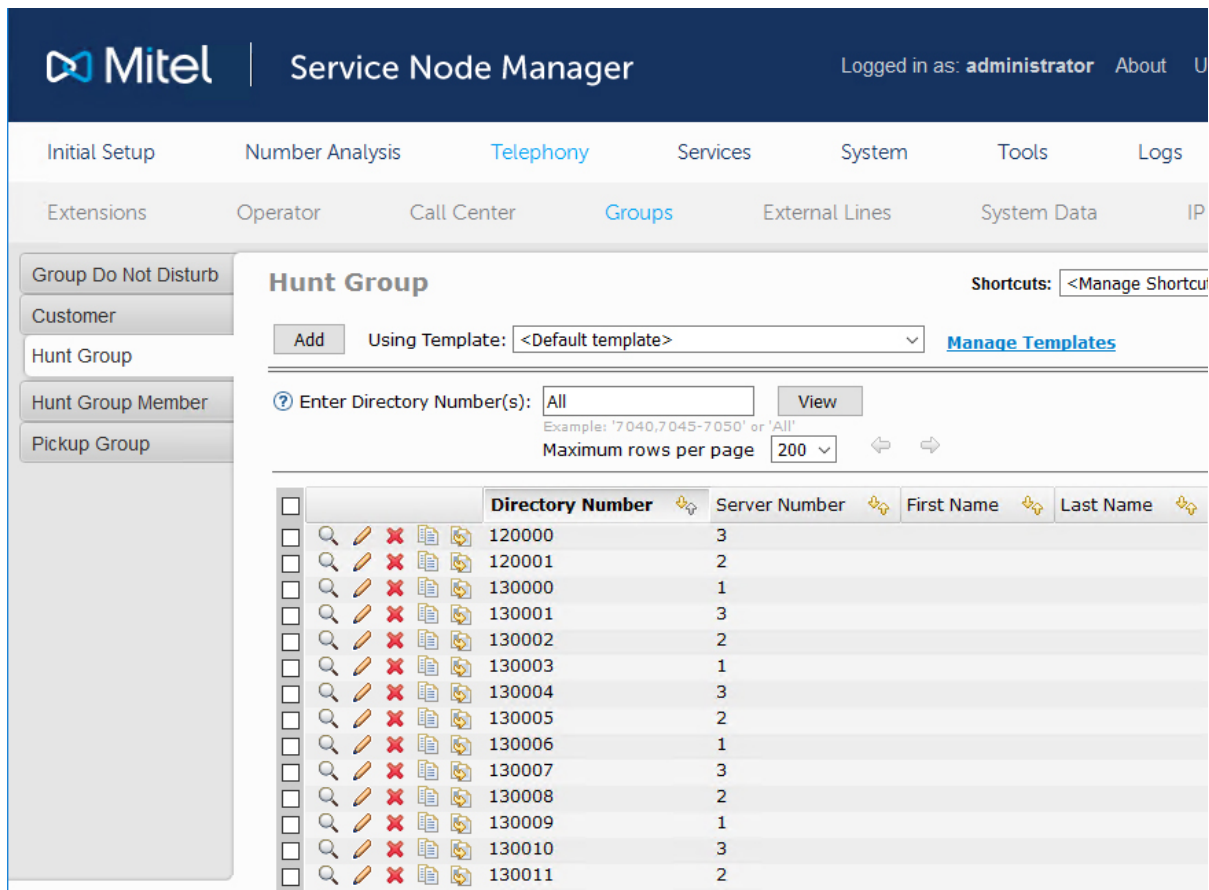
If everything is correct, then start the migration.

Migration Process

If all the setup is working as desired, it is time to execute the migration. The procedure below just shows the Virtualized system; however, the bare metal is quite similar. Instead of moving the server between networks, the Ethernet cables must be changed between the switches ports (VLANs).

NOTE: If the old system is equipped with MGU boards and those need to be updated, load the new FW on the MGU while the old system is in place and then activate the new FW from the old MX-ONE 5.0/6.x system (board_sw command), when the activate command is sent and completed, wait for 30 seconds and proceed with the Migration part 1.

Though it is not a mandatory step, but it saves time in the overall upgrade process. Because, while the MGUs are installing the new software and rebooting, the MX-ONE migration can happen.

Migration Part 1

This phase starts the downtime period. Before starting the migration, the MX-ONEs have the following settings:

- Current system
- Production network

- IP address X.Y.66.30

Figure 4.59: MX-ONE 5.0 Production
Network
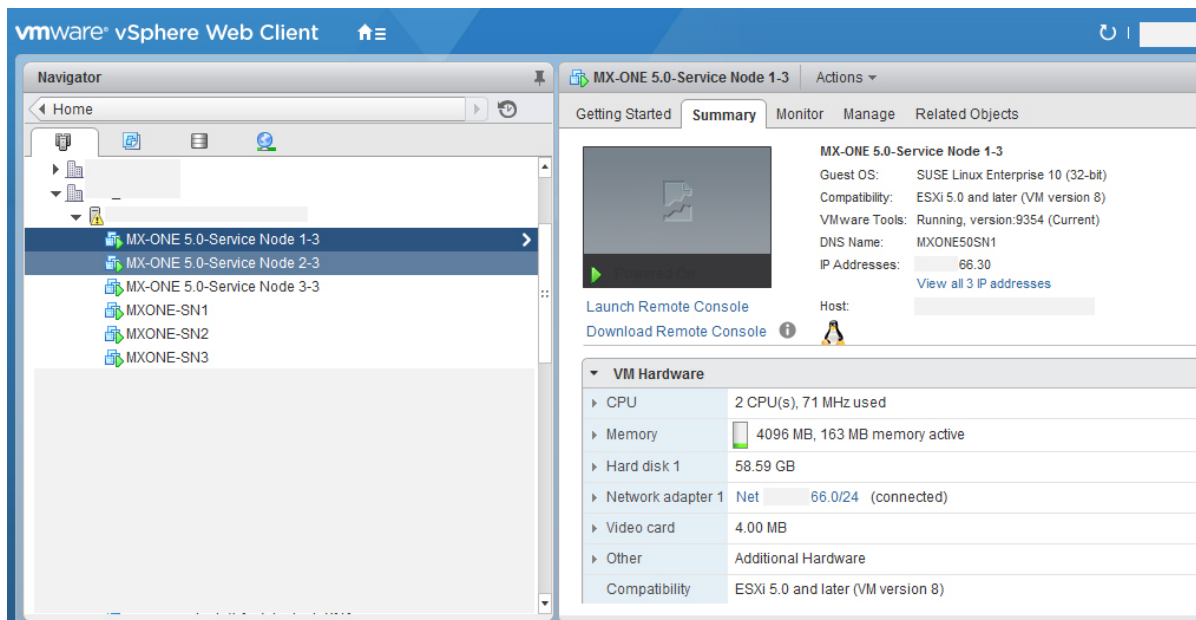
- New System
- Migration Network
- IP address X.Y.66.30.

Figure 4.60: MX-ONE 6.X Migration
Network
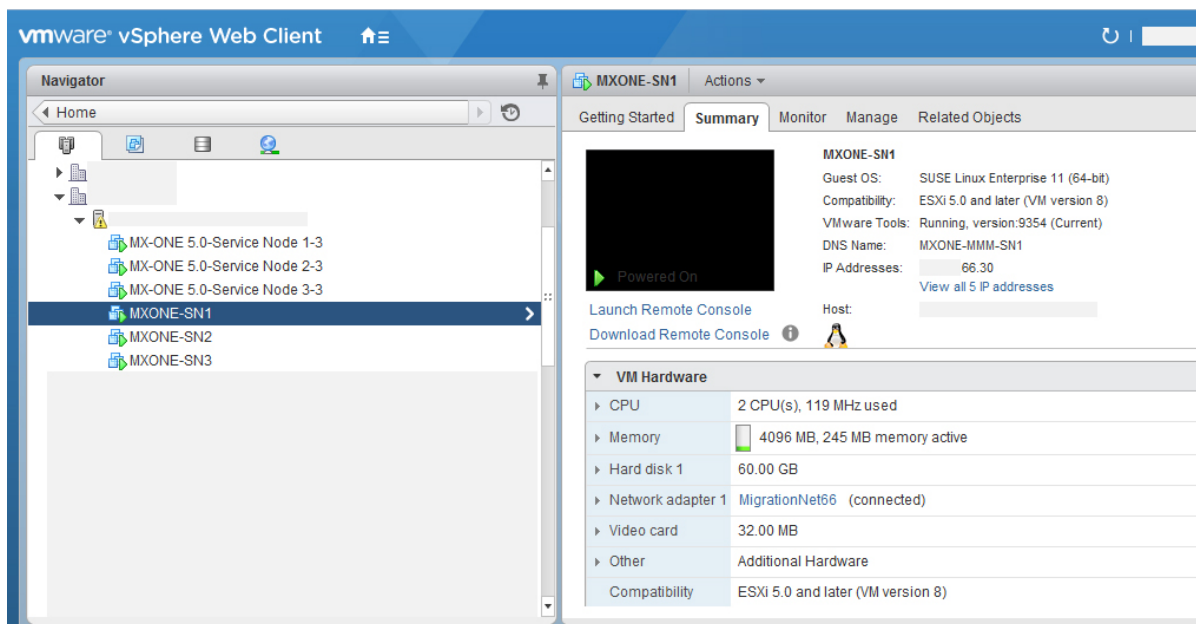
Move the current system from Production network to the Shadow network.

1. Go to the Virtual Machines for all Service Nodes server that compose the existing MX-ONE system and assign them to the Shadow network. During this process, there is no telephony service.

Figure 4.61: Migrating MX-ONE 5.0
Networks
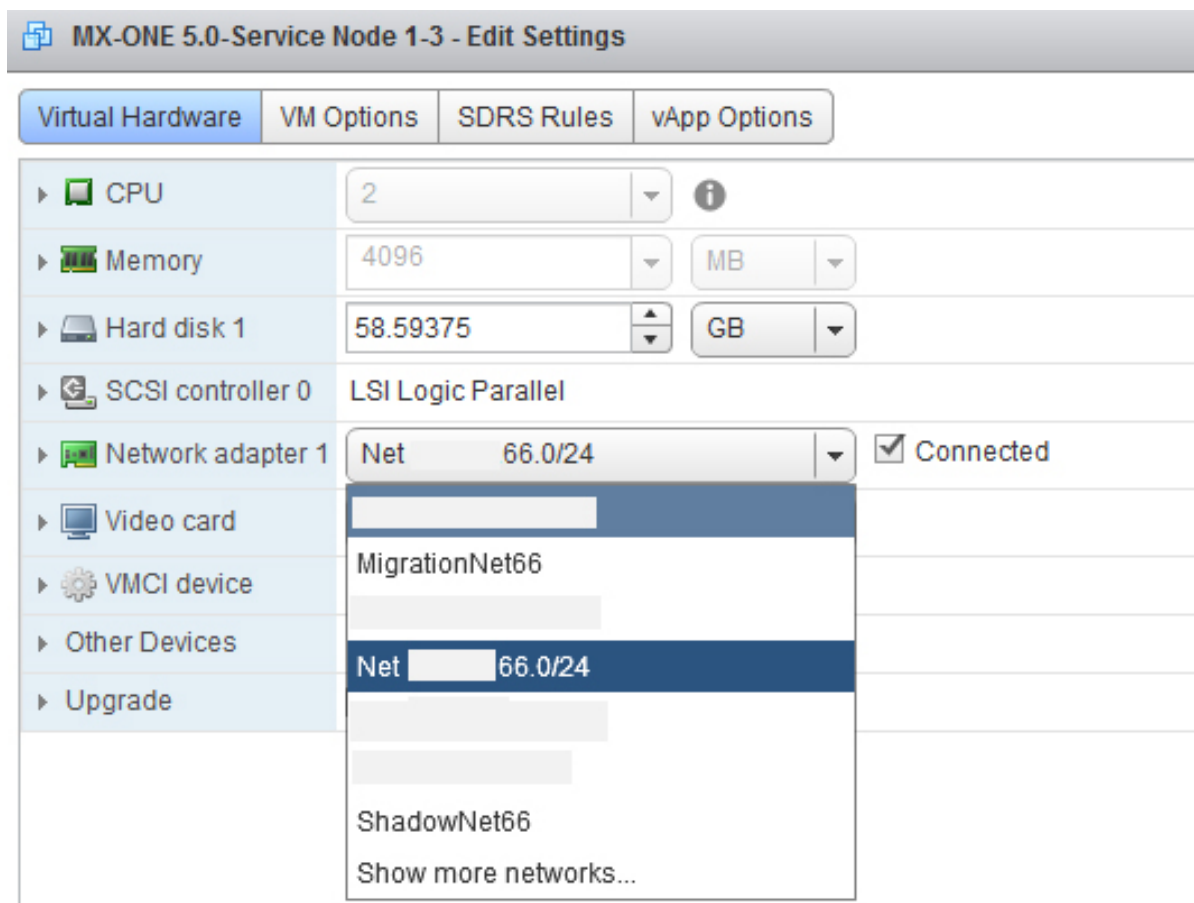
2. MX-ONE executes a data reload after the migration to the Shadow network is completed.

Figure 4.62: Environment After Migrating MX-ONE 5.0
Networks
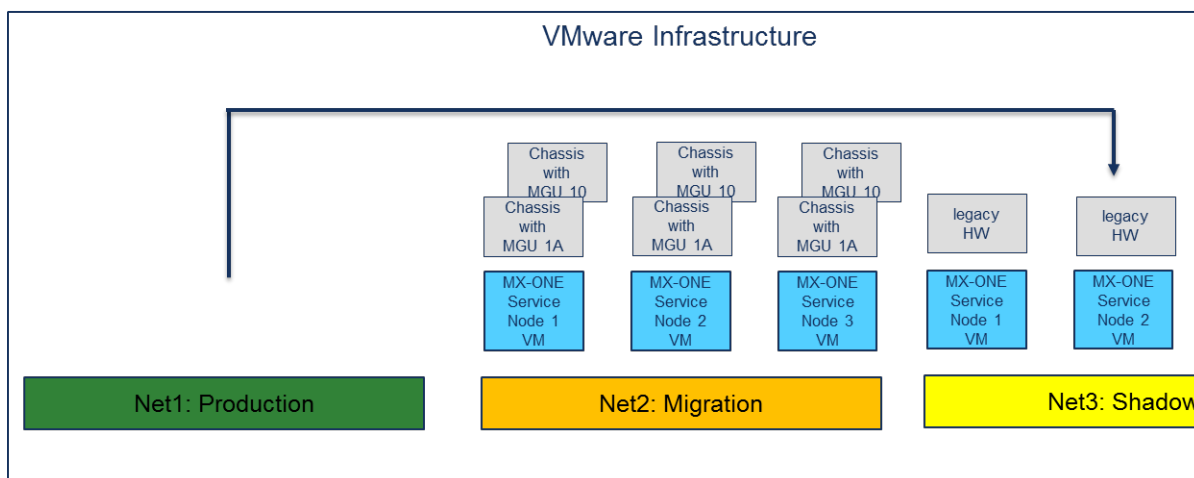
Migration Part 2

In this Migration Part 2 phase, do the following:

1. Move the new system from Migration network to Production network.
2. Go to the Virtual Machines that compose the MX-ONE system and move them across.

Figure 4.63: Migrating MX-ONE 6.2 to Production
Network
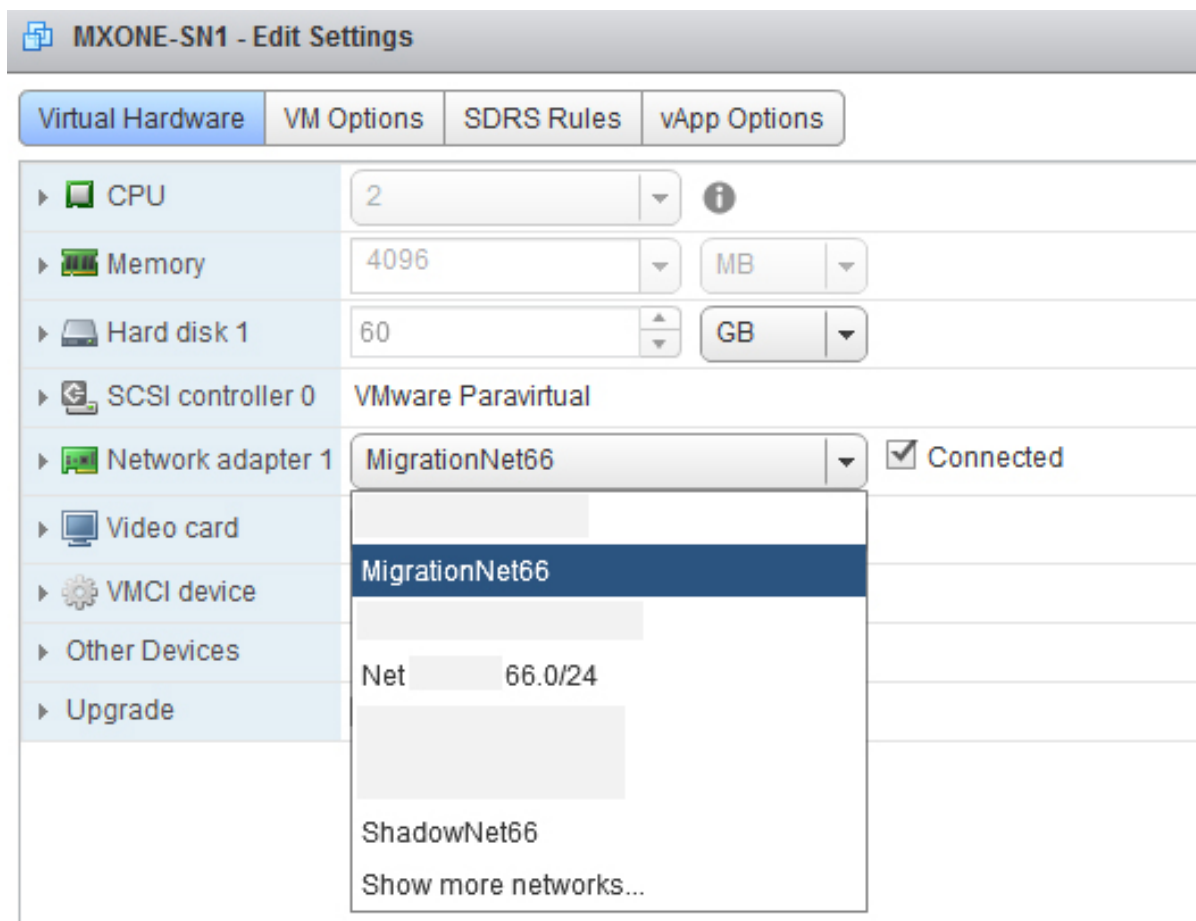
In the Virtualized system, this operation (migration part 1 and part 2) does not take more than two minutes, but that depends of the number of servers that are part of the solution. Practically, this took 1 minute and 10 seconds to migrate all 6 servers and the PC in the solution presented in this document.

Figure 4.64: MX-ONE 5.0 in the Shadow
Network
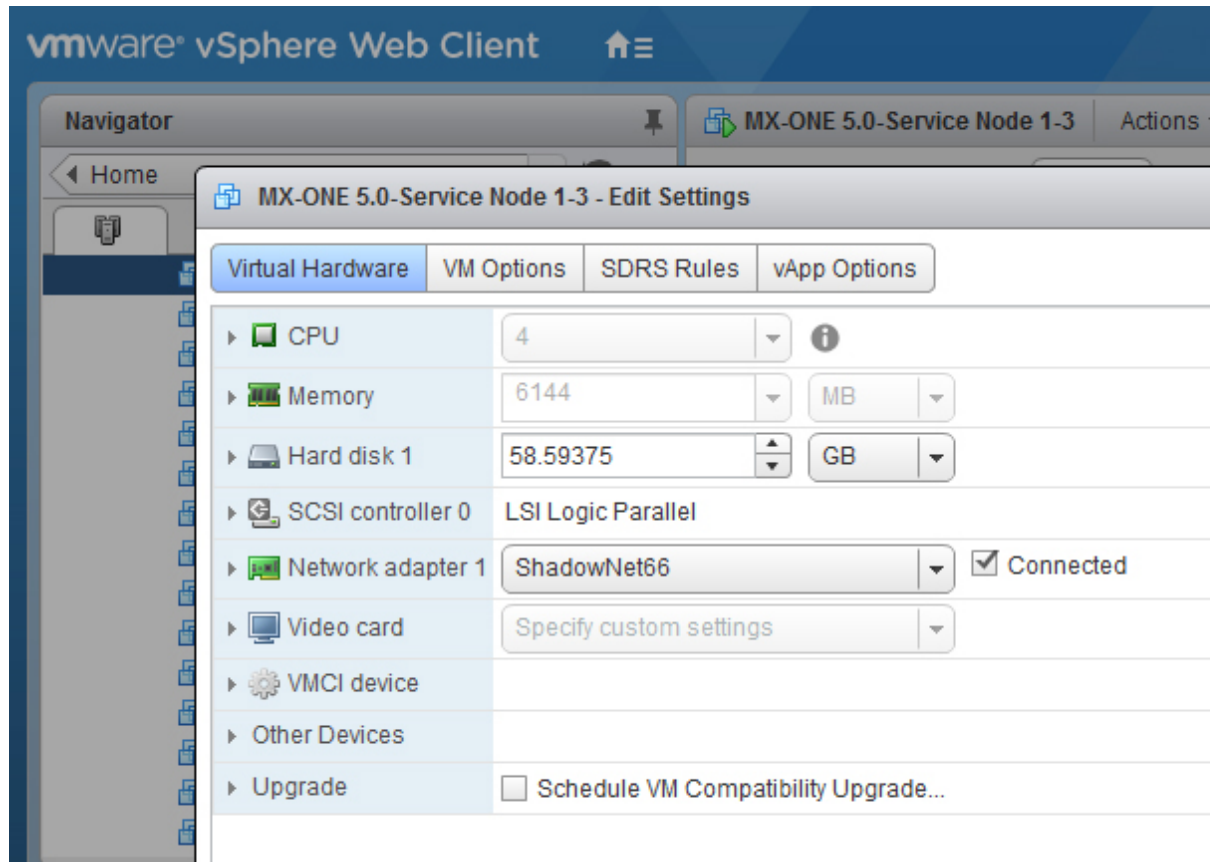
Figure 4.65: MX-ONE 6.2 in the Production
Network
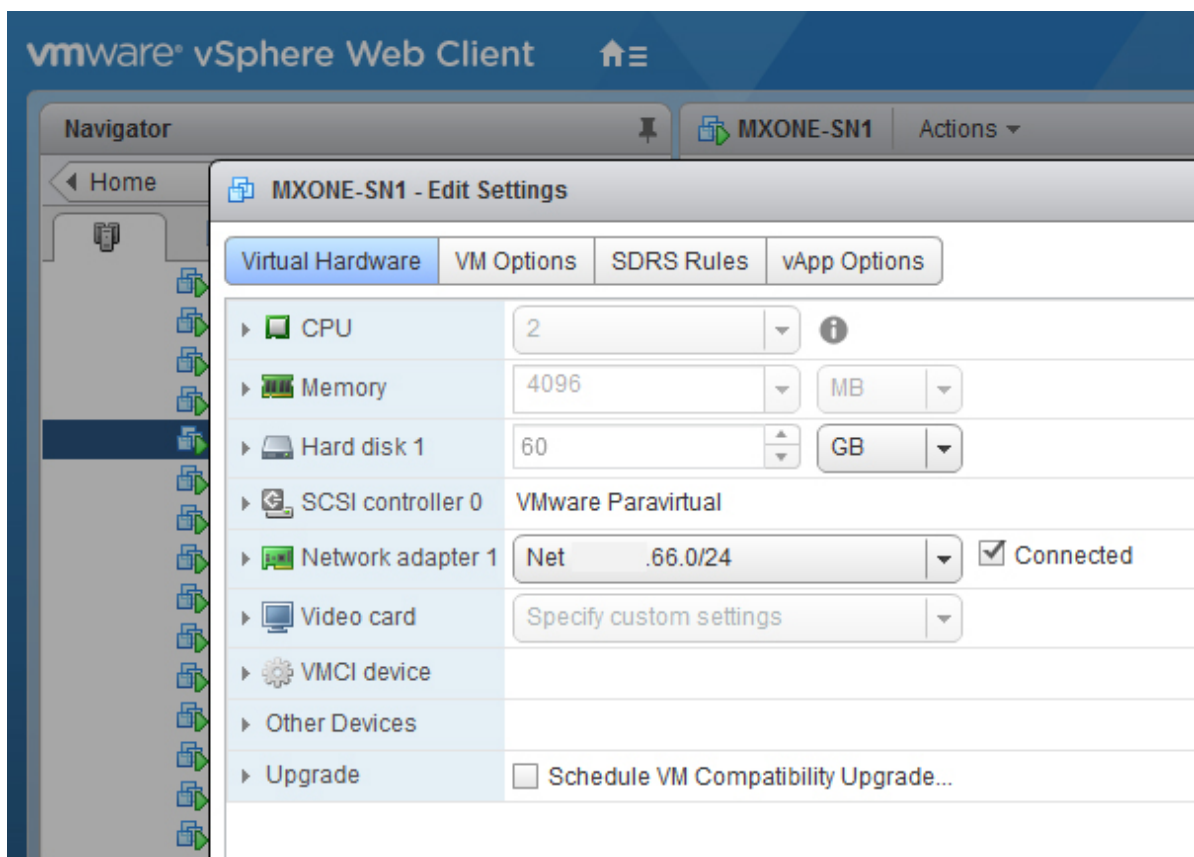
3. MX-ONE executes a data reload after the migration to the Production network is completed.

Figure 4.66: Environment After Migrating MX-ONE 6.X
Networks
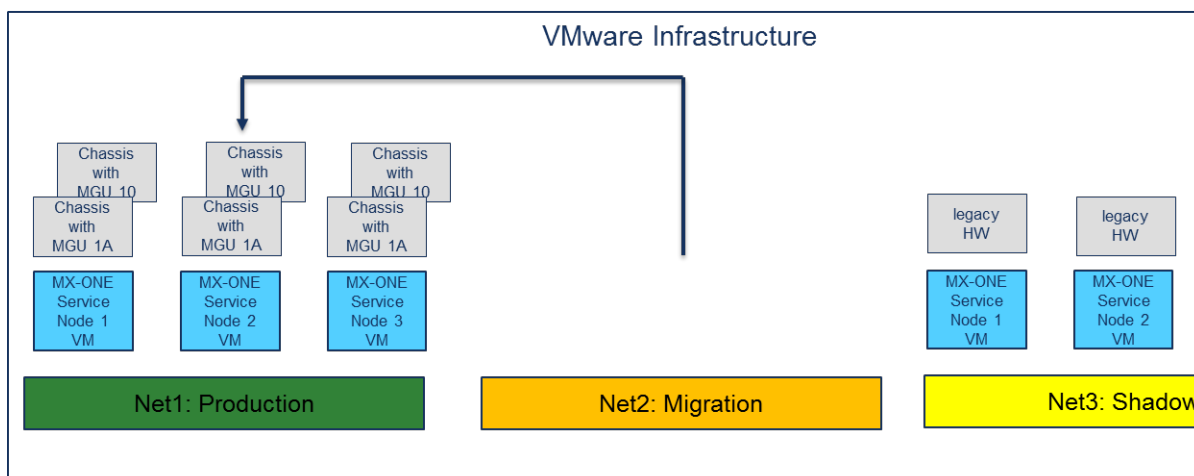
Down Time Phase

During the migration period down time occurs. The combined phase 1 and phase 2 duration is total time that MX-ONE system is out of service (no telephony service).

The total upgrade time in a customer when all the preparation was done in advanced can vary from a matter of 10 minutes to an hour for a centralized system with 1-10 servers on VMware, depending on size of MX-ONE system, number of MGUs involved and the number of SIP extensions.

NOTE: It depends of the customer infrastructure and the numbers above are average.

Final Verification

The following process narrates about the final verification steps:

1. Execute all tests required in the new system.
   – Verify that the MGUs (and associated end-points) are up and running and if all the SIP/IP extensions are moved to the new system.
   – Verify that all application interfaces are reconnected to the new system and working as per normal - MiCollab AM (formerly One Box), MiContactCenter Enterprise, InAttend, MiCollab, and so on.

2. Maintain the old system in standby on the Shadow network until final acceptance date of the new system.

   – Keep the old system in the Shadow network for a particular time frame as customer wants.
   – In case of a serious cutover/failure or serious problems found with the new system, the Standby network brings back online with minimal downtime.
   – Once the acceptance phase is completed, this network is shut down and dismantled.

3. Perform backups in Service Node, Provisioning Manager, and Service Node Manager and transfer them to a safe place.

4. Keep all backup up to date.

5. Delete the old VMware snapshots, if they were created.

General

Scope

This document describes the upgrading procedure from MX-ONE 5.x, or 6.x to MX-ONE 7.x, which means a new installation due to the new operating system version, and new system database (Cassandra), for the MiVoice MX-ONE system. This document details the installation instruction *UPGRADING AND UPDATING, GENERAL*.

There are two alternative ways to regenerate the system telephony data (both reload data and system database data) at upgrade, one by copying the data from the old system database, using a **Regeneration Script Utility**, converting it to CSV format, and entering it in the Cassandra database, and the other by using the legacy **PC-Regen application** function.

The document also describes updating of MX-ONE 7.0 to MX-ONE 7.x.

NOTE: Regeneration Script Utility is used to regenerate the data only when you are doing upgrade from a MX-ONE 6.3 SPx system to MX-One 7.x. It cannot be used doing upgrade from a 5.x, 6.0, 6.1 or 6.2 system to 7.x.

Target Group

This document is intended for installation-, service-, support technicians and system responsible.

Prerequisites

MiVoice MX-ONE 7.x system build with Linux SLES12.

Preparations

A backup of the old system's data using the legacy PC-Regen application should always be done before starting the upgrade procedure.

A new license file must be ordered for the 7.x system, and that requires the system identity, so the server(s) must be running.

When Upgrading to or Post MX-ONE 7.4

In MiVoice MX-ONE 7.4, the concept of Extension Category (CAT) will become obsolete. The Extension Common Service Profile (CSP) will be used instead of CAT. CSP will be used for all types of extensions in MiVoice MX-ONE 7.4.

During upgrade, new CSP will be created for every unique combination CAT and ADC parameters and for category data which cannot be mapped to a CAT (extension with CAT = '-') that is used in the existing system. The new created CSP will be allocated using CSP number 257-500. This means that maximum 244 new CSP can be created from existing CAT and ADC parameter settings.

In MX-ONE 7.4, there is a script included that can be executed to see how many new CSP can be created at the upgrade to MX-ONE 7.4. If the result output from the script indicates that more than 244 new CSP will be created. Manual actions are needed to reduce number of used CAT and ADC combination in the existing 7.x system before running the upgrade to MX-ONE 7.4. The script can then be executed again to see if number of new CSP will be less than 244.

NOTE: A `data_backup` is needed to be done before running the script again.

The script can be executed after the MX-ONE 7.4 package has been distributed to the system but before running Prepare Upgrade or Upgrade.

To run the script:

Replace below x.x.x with the version of the build number to upgrade to; for example, 7.4.0.0.34. **Root** password needs to be available to run the script.

See Online help text:

```
sudo -H sh /opt/mxone_install/7.4.x.x.x/target/utilities/cat_csp_translation.sh
-?
```

Executed script:

```
sudo -H sh /opt/mxone_install/7.4.x.x.x/target/utilities/cat_csp_translation.sh
```

Upgrade to MiVoice MX-ONE Service Node 7.x

NOTE: There are two alternative ways to regenerate the system telephony data at upgrade, one using the **Regeneration Script Utility**, *Upgrade Using Regeneration Script Utility* by copying the data from the old OpenLDAP database, converting it to CSV format, and entering it in the Cassandra database, and the other by using the legacy **PC-Regen application function** *Upgrade using PC-Regen*. The first alternative requires unchanged server (LIM) and media gateway configuration. DNS Domain, IP addresses and host (fqdn) names of the new installed MX-ONE 7.x system do not need to be the same as used in the old 6.3 SPx system. The second alternative must be used if the server (LIM) or media gateway configuration is changed during the upgrade.

NOTE: If upgrading from MX-ONE 6.x (or older release) to MX-ONE 7.x rollback is not possible, due to license, encryption, security and OS version changes. A new installation of the older release will be required in case the upgrade fails.

NOTE: Active DND will be cancelled at system restart or shutdown. So, when the system is powered on again, make sure you activate DND again manually if wanted.

Upgrade Using Regeneration Script Utility

This alternative is only valid when upgrading from 6.3 SPx to 7.x. The following steps are included in the upgrade procedure:

1. Collect Telephony data of old MX-ONE 6.3 SPx system (using `config_mirror`) function.
    For more information, see *Collecting Data from Source System*.

2. Install MX-ONE 7.x including its system database(s).

    For more information, see installation instructions for *INSTALLING AND CONFIGURING MIVOICE MX-ONE*.

3. Import saved Telephony Data (with the Regeneration Script Utility).

NOTE: Regeneration Script Utility cannot be used if Migration license feature is used in 6.x. You must upgrade using the legacy PC-Regen application function.

NOTE: See the Release Note of 7.x for more information concerning 6.3 SPX versions, for which the Regeneration Script Utility can be used to regenerate data.

Collect Telephony Data via regeneration script utility

To save the telephony configuration data from the old MX-ONE Service Node, and to restore the same data in the new MX-ONE Service Node, this upgrading procedure uses the regeneration script `regen.sh`for MX-ONE.

Perform the following steps to back up the data from the old MX-ONE:

1. Perform a data backup using command `data_backup`.
2. Enter the `config_mirror` command.
3. Store the `config_mirror` files containing all server data in a place outside the MX-ONE system. The `config_mirror` files are found in the directory **/mxone/mirror/version/dateandtime/**.

Install the MiVoice MX-ONE Service Node 7.x

For more information, see Installation Instruction for *INSTALLING AND CONFIGURING MIVOICE MX-ONE*.

Import Saved Telephony

After installation of the new MX-ONE 7.x system is completed, the following steps need to be performed for successful regeneration of the telephony data from the old MX-ONE system into the new MX-ONE system through the Regeneration Script Utility.

To restore the telephony data into the new MX-ONE system, the created `config_mirror` files from the old MX-ONE system must have to be transferred to the new system.

1. Login to the Master Server (LIM1) as mxone_admin.
2. Transfer the `config_mirror` files to the Master server and place them in a new directory (for example */tmp/upgrademirror*). You can do this through USB or copy function.
3. Start the Regeneration Script Utility by entering *sudo -H /opt/mxone_install/bin/regen_mirror_data* (see *sudo -H /opt/mxone_install/bin/regen_mirror_data --help*).
4. Select the directory where `config_mirror` files stored */tmp/upgrademirror*.
5. The regeneration script utility shows the data restoration progress. Check the printout and logs for errors.
6. Make a reload of the system. Use the `reload--system` command. The reload data is now in the program units.
7. Check that the system is running stable after the reload is completed.
8. Run the command `license_normalize` to update license usage according to new license structure MX-ONE 7.x.
9. Take a data backup of the system using the command `data_backup`.
10. Do a new `config_mirror` of the system with the command `config_mirror`.
11. Install the new 7.x license file using mxone_maintenance tool.
12. Make a new `data_backup` and `config_mirror` of the system.

Regeneration Summary with Regeneration Script Utility

Basically, all system database data and all the reload data can be regenerated through the Regeneration Script Utility.

The features (commands) listed below are not regenerated and must be entered manually:
* Call logging (callinfo_* commands)
* `ring_signal`
* `recorded_announcement_prompt`
* Traffic Measurement (TRDIP)

Upgrade using PC-Regen

The following step are included in the PC-Regen upgrade procedure:
1. Collect Telephony data (with *PC-Regen-compact*).
   Fore more information, see Collection regeneration of data, via PC-Regen on page 5.
2. Install MX-ONE 7.x including its system database(s).

For more information, see installation instructions for *INSTALLING AND CONFIGURING MIVOICE MX-ONE*.

3. Import saved Telephony Data (with *PC-Regen-compact*).

    Fore more details see *Import and Restore Saved Telephony Data through PC-Regen*.

Collection Regeneration of Data through PC-Regen

To save the telephony configuration data from the old MX-ONE Service Node, and to restore the same data in the new MX-ONE Service Node, the upgrading procedure uses PC-Regen-compact for MX-ONE.

Perform the following steps to back up the data from the old MX-ONE:

1. Download PC-Regen-compact from the provided web page.

2. Collect the old source data.

3. Backup the telephony data from the old system.

4. Perform the regeneration.

Collecting Data from Source System

For regeneration PC-Regen-compact uses a source and a target directory. The data collected from the old system shall be stored in the source directory. The regenerated data will be stored in the target directory.

The default source directory is located as "*…\PC-Regen.compact\source*" at the installation point.

The default target directory is located as "*…\PC-Regen.compact\target*" at the installation point.

For simplicity the whole directory structure …\PC-Regen-compact can be copied to a different place and leaving the installed directory as a reference. This is useful when several systems shall be generated because the default source directory can be used.

If different paths are to be used they need to be specified at runtime.

A batch file to collect the old data is needed. To generate this run the program either from the installation menu (or by clicking on the PC-Regen-compact.exe) and select a target system, a source system and when asked to generate a batch file answer yes.

The following files will be generated:

Table 4.1: Generated files

data_gen.batch	This is the batch file for collecting old data site name.
racep2.batch	This file is to collect customer based recorded voice announcement.
pu_add_info.batch	This file is to collect special program units.
gjtsp2.batch	This file is used when upgrading from an old TSW based source.

If the file transmission is going to take place from a Linux/Unix machine, the file data_gen.batch is preferably converted to Unix format (using dos2unix or equivalent). The rest of this section assumes this is the case.

The files above shall be put under the directory labeled source and zipped together in a special file (that is, data.zip). Then this file is moved to a directory, from where the collection takes place, that is the Lim 1 server under directory /tmp/upgrade.

The special file is then unzipped in the collection directory on the server.

From the collection directory using SSH sends the following command:

```
serverLim1/tmp/upgrade # source data_gen.batch | tee TS1log.txt
```

Zip the output in the collection directory using command:

```
serverLim1/tmp/upgrade # zip -j pcregenSource.zip *
```

NOTE: The -j option does avoid including the directory structure.

Move the file pcregenSource.zip to the selected PC-Regen-compact source directory and unzip it.

You now have the necessary data collected under the PC-Regen-compact source directory.

Perform the Data Generation

When the source files are present in the PC-Regen-compact source directory we are ready for a data regeneration.

1. Run the program from the installation menu (or by clicking on the C-Regen-compact.exe).

2. Select your target system, your source system.

3. On the question to generate a batch file answer no,

4. On the question for syntax check answer no.

5. You will then get a prompt:

   Regeneration MX-One... --> MX-ONE..Source path**:.\source**
   Regeneration MX-One... --> MX-ONE..Target path **:.\target**
   OK? y/n :

6. Here you get an option to change source and target paths, otherwise just select y and the regeneration will start.

For more information, refer to the *PC-Regen-compact* document.

Install the MiVoice MX-ONE 7.x

For more information, see Installation Instruction for *INSTALLING AND CONFIGURING MIVOICE MX-ONE*. The Cassandra database will also be installed.

Import and Restore Saved Telephony Data through PC-Regen

After installing the new MX-ONE, the following steps need to be performed in PC-Regen for successful regeneration of the telephony data from the old MX-ONE system into the new MX-ONE system.

To restore the telephony data into the new MX-ONE system, the created Init-files first have to be transferred.

• Zip the folder mentioned in the Target path on the main window of the PC-Regen-compact application. Name it pcregenTarget.zip

• Connect the host system to the new MX-ONE system through the file transfer tool.

• Connect to MX-ONE through SSH, do as following:

- – Log on by providing a user name and password.
- – Type in the following command to unzip the target file: serverLim1/tmp/upgrade # unzip pcregen-Target.Zip.
- – Type in the following command to remove formatting: serverLim1/tmp/upgrade # dos2unix *.
- – Type in the following command at the prompt: serverLim1/tmp/upgrade # mdsh REGENCMD.TXT I tee upgradeLog.txt.
- – Wait till the prompt reappears.This command will run the Init files, restoring the telephony data from the old MX-ONE into the MX-ONE system.
- – Check the file upgradeLog.txt for no or wrong loaded data.
    - **NOTE:** The MX-ONE periodically performs data backups.
- – – Finally, back up the system data by typing in the following command: `serverLim1/tmp/upgrade mdsh -c data_backup`.

- Exit the SSH sessions and close the file transfer tool.

Regeneration Summary with PC-Regen

Manually Regenerated Commands (if wanted)

Some commands cannot be regenerated by PC-Regen-compact. However, these commands are stored in the Target folder in the MX-ONE system in corresponding text files. Based on the need, run the corresponding SET command manually at the MDSH prompt with the data in the corresponding file to configure the new MX-ONE system with the data from the old MX-ONE system.

License file update shall be done via the `mxone_maintenance` script.

The following table shows list of commands that cannot be regenerated by PC-Regen or by manual entering:

Table 4.2: Not regenerated files (using PC-Regen)

Command Not Regenerated	Corresponding File Name
alarm_cfg_reread	alarm_cfg_reread
alarm_cfg_reread	trace
callinfo_output	callinfo_output
recorded_announcement_prompt	recorded_announcement_prompt
ring_signal	ring_signal
TRDIP	TRDIP

NOTE: recorded_announcement_prompt initiate file needs to be manually updated by entering the values of parameters "-host" and "--path" and also uncommenting the entries of initiate file before executing them in the Service Node.

Example:

#recorded_announcement_prompt --load -m 1A --host $HOST$ --file message001.wav --path $PATH$

The above initiation needs to be uncommented and should manually edit the values of "-host" and "-path"

recorded_announcement_prompt --load -m 1A --host 203.0.113.10 --file message001.wav --path user/rva/messages.

Automatically regenerated Commands, summary

Basically all commands except the ones mentioned above shall be automatically regenerated. Note that Table 4.3 Automatically regenerated MML Commands on page 13 and Table 4.4 Automatically regenerated Unix-style commands on page 14 are not complete.

Table 4.3: Automatically regenerated MML Commands

Commands
AC: *ACGRI,ACTNI*, ACPAC
AD: *ADCOI, ADINI*
AS: *ASPAC*
CD: *CDCOI*, CDINI** (* = replaced, see section 4.3.5)
CH: *CHCMI*
EX: *EXTEI*
GD: *GDNDI*
GH: *GHGMI, GHGRI*
GP: *GPAGI, GPGMI, GPGRI*
IC: *ICFUC*, ICFUI, ICMWP
IS: *ISEPI,ISFUI*
KS: *KSANI,KSCHC, KSEXI,KSFKC,KSMDI, KSADC*
LC: *LCDDI,LCLDI,LCOPI,LCTDI*
NC: *NCCOI, NCGMI, NCGRI,NCICI, NCNOI, NCSGI*
OP: *OPADC, OPCGS, OPCTS,OPERI, OPISS, OPRSC, OPSAI*,OPNEI, OPCEI
PA: PAGII
RA: *RACEI, RADSI, RAEQI, RAGAI, RAGMI, RAGPI, RAMDI*, RADNI
RI: *RIANI*
RO: *ROAPI, ROCAI, ROCDI, RODAI, RODDI, RODNI, ROEQI, RONDI, RORNI, ROVNI*
SP: *SPEXI*
TR: *TRDPI, TRRSI*
VM: *VMFUI, VMGEI,VMPOI*

Table 4.4: Automatically regenerated Unix-style commands (Sheet 1 of 2)

Commands
account_code_init
alarm_action
alarm_input
alarm_output
auth_code
board_config
callinfo_condcode_set
callinfo_mask_set, callinfo_output_set, callinfo_status_set, callinfo_qos_report_set
call_list
call_list_profile
csta
csta_authentication
dect_cfp, dect_extension, dect_rfp, dect_system_id
diversion
diversion_common
diversion_system
exchange_info
extension, extension_key, extension_profile, extension_text, extension_registration_distribution* * = extension_key cannot be automatically regenerated if extra key panels are used for Mitel 6800/6900 SIP phones.
external_directory
global_traffic_data
ip_domain
ip_extension
ip_gatekeeper
language_strings_override
media_gateway_config
media_gateway_interface

Table 4.4: Automatically regenerated Unix-style commands (Continued) (Sheet 2 of 2)

Commands
media_encryption_enable
media_server
media_server_message
name
number_conversion_initiate
number_initiate
number_data_initiate
parallel_ringing
remote_extension
route_data_common
sip_domain
sip_route
sec_policy
sms_server_initiate
sms_client_initiate
streaming_data
traffic_matrix (new)
trsp_synchronization, trsp_connection
vacant_number

Moved or removed commands and parameters

The following commands did exist in earlier version of MX-ONE, but have either been removed, or replaced by Unix-style dittos.

- DECT commands have been replaced to Unix-style commands replacing the CX commands as follows:
  – CXAKX: dect_extension
  – CXSYX: dect_system_id
  – CXCFP: dect_cfp
  – CXRFP: dect_rfp

- The CDCOx commands have been replaced by the Unix-style diversion_common commands. The *SYTDS* command has partly been replaced by the diversion_system command. Also PARNUM 121 from the *ASPAx* commands has been moved to diversion_system. The CDINx commands have been replaced by the diversion commands.

- *NIINx* commands have been replaced by the name commands.
- In the `extension` command the parameter --third-party-sip-client is replaced by --third-party-client. There are also additional diversion related parameters in the `extension_profile` commands.
- In `extension` and `extension_text` command language parameter is replaced by language-code.
- Command `csta_initiate` has been replaced by `csta`, and `csta_status` has been removed.
- The command `EMFUI` in MD110/TSW is not supported in MX-ONE.
- The `CPDLx-` and `ROELx-` commands are replaced by the `route_data_common` command.
- The `FTxxx` command have been replaced by the `failure_transfer` command.
- The `SUDIx`, and `SUSIx` commands have been replaced by the `resource_status` and `vacant_number` commands.
- The `SYDAS`, `SYIDI`, and `SYTDS` commands are replaced by the `global_traffic_data` command.
- The `TCMAx-` commands are replaced by the `traffic_matrix` commands.
- The `license_migration` command has been removed (from version 7.0).
- The GHxxx commands are replaced by the `extension_group`, `extension_group_member`, and `extension_group_profile`.

Upgrade Manager Applications to MX-ONE 7.x

The Manager Applications require some special handling at upgrade, due to their separate databases. Note the name change of PM (former MP) and SNM (former MTS).

To upgrade **Provisioning Manager** (PM) and **Service Node Manager** (SNM), the following database backup procedure is required.

Upgrade from 5.x to 7.x

For Upgrade from 5.x to 7.x, follow the below procedure to take backups.

Backup Service Node Manager

To backup Service Node Manager database, follow the below procedure to take the backup:
1. Ensure that you are logged in as root.
2. Create a folder; for example, /home/eri_sn_admin/TSBackup/
3. Change the permission to allow postgres to write in the folder, such as chmod 757 /home/eri_sn_admin/TSBackup
4. Save all data of WBM database, and do the following:

    a. Use the following command: `su postgres -c "pg_dump -a -d WBM -f /home/eri_sn_admin/TSBackup/wbm_data_only.sql"`
    b. Enter the password for the database if asked, which is by default MX-ONE 5.x.
    c. Save all data of QoS Database and use the following command: `su postgres -c "pg_dump -U postgres QoS -f/home/eri_sn_admin/TSBackup/QoS_entire_data.sql -C --inserts"`
    d. Enter the password for the database, which is default in MX-ONE 5.x.

    e. Copy the created files to an external media; for example, a USB memory or another safe location.

Template Data Backup

To backup templates, follow the below procedure:

1. Ensure that you are logged in as root on the Manager Telephony System Server.
2. Use the following command to archive the templates.
3. "`tar -cf customer.tar --directory=/opt/jboss/server/default/conf/templates customer`".
4. Copy the *customer.tar* file to an external media; for example, USB memory.

Backup Provisioning Manager

If Provisioning Manager and Service Node Manager are installed on the same server or on different servers, the data for Provisioning Manager must be saved. This is because, upgrading Service Node Manager clears the database that is used by Provisioning Manager.

In case of stand-alone system, taking backup from *mp_config* and backing up of template is sufficient.

To backup Provisioning Manager database in the MX-ONE 5.x/6.x, do the following:

1. Log on to the Provisioning Manager Server as root.
2. Create a folder in `/home/eri_sn_admin/TSBackup/` if it does not exist. Such as `mkdir -p /home/eri_sn_admin/TSBackup/`.
3. Enter the command `mp_config` and select database backup.
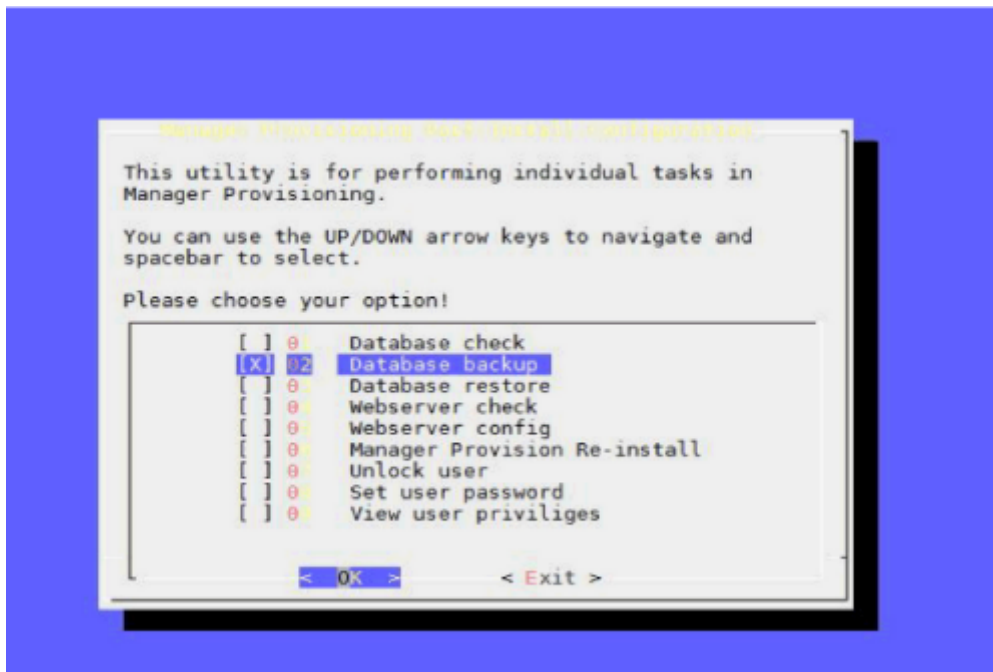
4. Backup PM (former MP) database is stored in directory: `/var/opt/eri_mp_config/` with a file name starting with **mpManagerPostgresDump** followed by date, rpm version and release details.
5. Save all data of Quartz Database using the following command:

```
su postgres -c pg_dump -a -d Quartz -f/home/eri_sn_admin/TSBackup/Quartz_-
data_only.sql.
```

6. Enter the password for the database, which is default in MX-ONE 5.x.

7. Copy the created files (or the entire directory) to an external media; for example, a USB memory or another safe location.

Template Data Backup

To backup templates, follow the below procedure:

1. Ensure that you are logged in as root on the Manager Telephony System Server. This is useful when the Provisioning Manager is in different server (standalone).

2. Use the following command to archive the templates.

3. *tar -cf customer.tar --direc-tory=/opt/jboss/server/default/conf/templates customer*"

4. Copy the *customer.tar* file to an external media; for example, USB memory.

Upgrade from 6.x to 7.x

For Upgrade from 6.x to 7.x, follow the below procedure to take backups.

Backup of PM and SNM in 6.x

The procedure remains same for standalone and collocated system. In case of standalone system, the command has to be executed once in standalone PM setup and once in SNM setup, and respective files should be used for restore.

Follow the below procedure:

1. Download the pm_snm_6.x_backup script mentioned to the instruction in the release notes.

2. Execute the pm_snm_6.x_backup script using below command, `sudo sh pm_snm_6.x_backup`

3. After the execution, the files get saved in */local/home/TSBackup*

4. Copy all files in */local/home/TSBackup* directory to an external media; for example, USB memory

Restore

This topic describes the restore operations that you need to perform prior to upgrade.

Restore Service Node Manager

NOTE: Before executing this step, first take data backup of MX-ONE, and then restore MX-ONE data.

To restore Service Node Manager, do the following:

1. Log in the Service Node 1 as mxone_admin.

2. Create a folder named TSBackup in */local/home/mxone_admin*.

3. Copy the Manager Telephony System's data files (wbm_data_only.sql, QoS_en-tire_data.sql, customer.tar) to */local/home/mxone_admin /TSBackup Directory*.

4. Provide the 755 permissions to these files (chmod 755 <filename>).

5. Enter the command `sudo -H webserver_config`

6. Select Other Utilities.

7. Select option Migrating old version SNM Data (SNM DB,....) and follow the instructions.

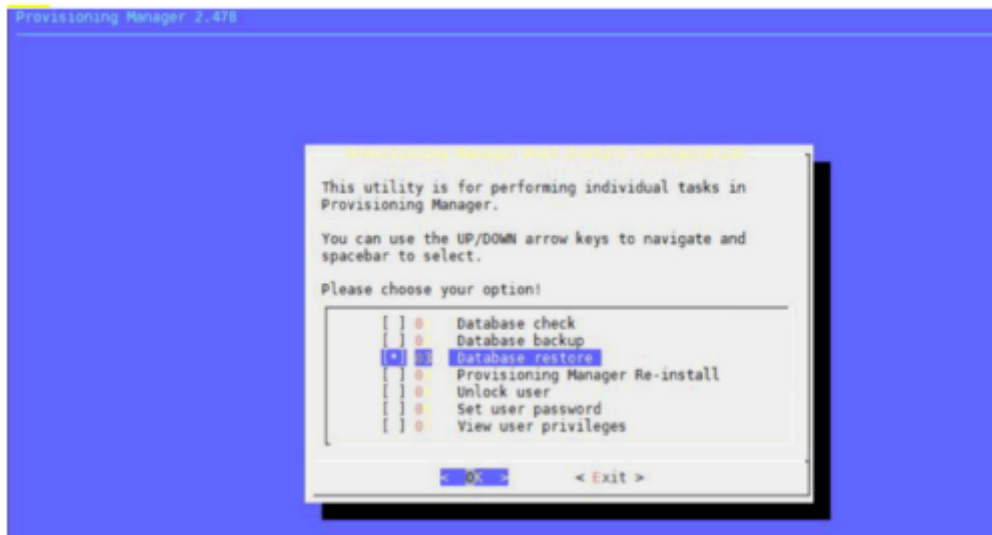## Restore Provisioning Manager

NOTE: Restore **Service Node Manager** before restoring **Provisioning Manager** in case of co-existence system.

To restore the backup in **Provisioning Manager**, do the following:

1. Copy the Manager Provisioning data files *mpManagerPostgresDumpxxxxxx, Quartz_data_only.sql, customer_mp.tar*) files to */var/opt/mxone_pm_config/Directory*

2. Ensure that the files are owned by root user.

   NOTE: If you do not have the folder in */var/opt/mxone_pm_config/*It is understood that **Provisioning Manger** is not installed on this server as it is not automatically installed like **Service Node Manager**.

3. Execute the command `mp_config` and select Database restore. The script takes care of restoring PM, Quartz databases and *Customer_mp.tar* (Customer template) data.

4. Remove the *Quartz_data_only.sql* and *customer_mp.tar from /var/opt/mxone_pm_config* directory after data restore and restart.

5. Login as root and execute the following:

   – *rm -f /var/opt/mxone_pm_config/Quartz_data_only.sql*
   – *rm -f /var/opt/mxone_pm_config/customer_mp.tar*

6. For the setup where **Service Node Manager** and **Provisioning Manager** were co-existing before the upgrade, and Provisioning Manager will be stand alone after the upgrade. Modify the following data after SNM and PM restore is completed:

   a. Login to the PM and update the IP/FQDN of the SNM in Subsystems.
   b. If PM authentication is used in SNM, which is running on SNM as mxone_admin user (sudo mxone_maintenance) > webmanagement > Set SNM to authenticate to PM or Linux > Change To/Keep PM authentication and enter the IP/FQDN of PM.

    c. Exchange between SNM and PM the root certificates, if needed in sudo mxone_maintenance > webmanagement > Root Certificate Management > Download Server Certificate by connecting to trusted host.

Update from MX-ONE 7.0 to MX-ONE 7.x

When updating from MX-ONE 7.0 to 7.x, the SLES12/Linux operating system is the same, but a new Service Pack (for 7.0 SLES 12 SPx is included) may be needed. See the installation instruction *UPGRADING AND UPDATING, GENERAL*.

You normally do not need data regeneration for updates, but the PC-Regen procedure can be used in case it is needed.

For re-installation of a MX-ONE 7.1 (and above) with unchanged server (LIM) and media gateway configuration, it is possible to use the Regeneration Script Utility. Config mirror files or a safety backup tar file from the MX-ONE 7.x system to be reinstalled is used as source (see */opt/mx_install/bin/regen_mirror_-data—help*).

Appendix A, Exception cases for PM and SNM

The upgrade process of the MX-ONE Service Node does in normal circumstances not require any manual handling of configuration and/or data connected to Service Node Manager (SNM) or Provisioning Manager (PM). However, the process might be inter-rupted for some unexpected reason. This could for instance be a manual interaction or a power failure.

To enable the possibility to restore configuration and data after such failure you are advice to take the following steps before the upgrade process starts. In case of need for restoration, contact your service partner for advice.

Save Data for Service Node Manager

For more detailed information, see the section Import and restore saved telephony data through PC-Regen and Regeneration summary with PC-Regen for 5.x systems and see the section Collection regeneration of data through PC-Regen for 6.x systems.

Save Data for Provisioning Manager

For more detailed information, see the section import and restore saved telephony data through PC-Regen and Regeneration summary with PC-Regen Script Utility for 5.x systems and see the section Collection regeneration of data through PC-Regen for 6.x systems.