

Dimetra IP Compact / Scalable System

Overview



Dimetra IP Compact R1.0 Feature Overview

System Information

- **Sites**
 - MTS2 and MTS4 Base Stations
 - EBTS (for 800MHz)
- **Consoles**
 - Vortex MCC7500
 - Local or remote operation
- **Network Manager terminals**
 - Historical reports
 - Alarms & Monitoring
 - Zonewatch
 - Local or remote operation

Supported Services

- **Voice Services**
 - Individual & Group
 - Telephone calls services
- **Dispatch voice call services**
 - Emergency Calls
 - Dispatch patching
 - DGNA
- **Data Services**
 - Short data Services
 - Packet data Services
- **Security Services**
 - Authentication
 - Air Interface and E2E Encryption
 - Authentication (AuC) and Provisioning Centre (PrC)
 - E2EE Key Management Facility (KMF)

Start Small – the basic voice rack

Two rack options:

Basic Voice Rack

- Voice only services
- Dispatch & NM capability



Enhanced System Rack

- Modular configuration



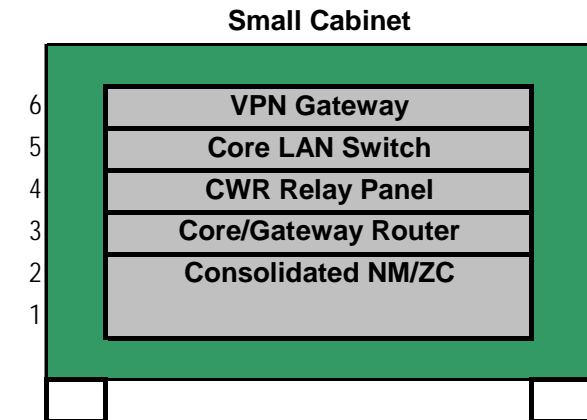
Start Small – the basic voice rack

Services supported

- **Voice service only**
 - Ind & Group Calls

Expansion Capability

- **Single site -> multi**
- **Additional dispatch & NM**



Enhanced System Rack

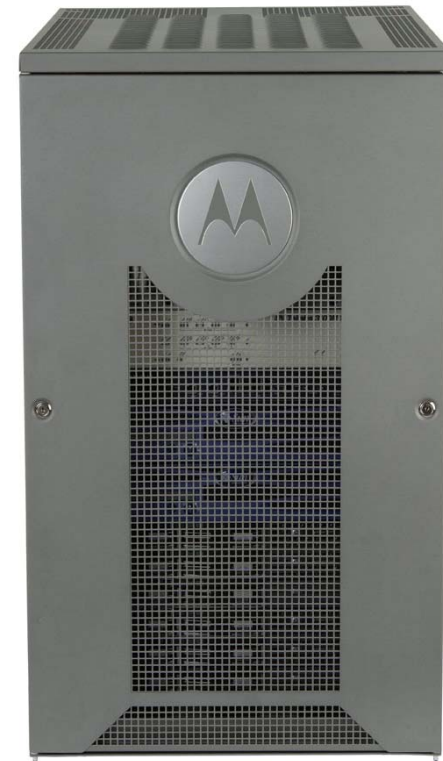
Start small and grow big

Services supported

- Full suite of voice, data, security and network services

Expansion Capability

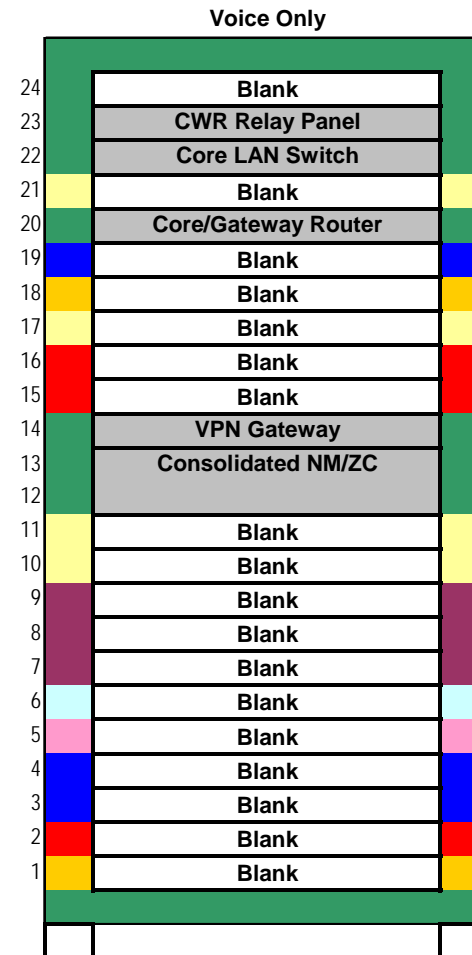
- Single site -> multi
- Start with voice and add incremental services as required



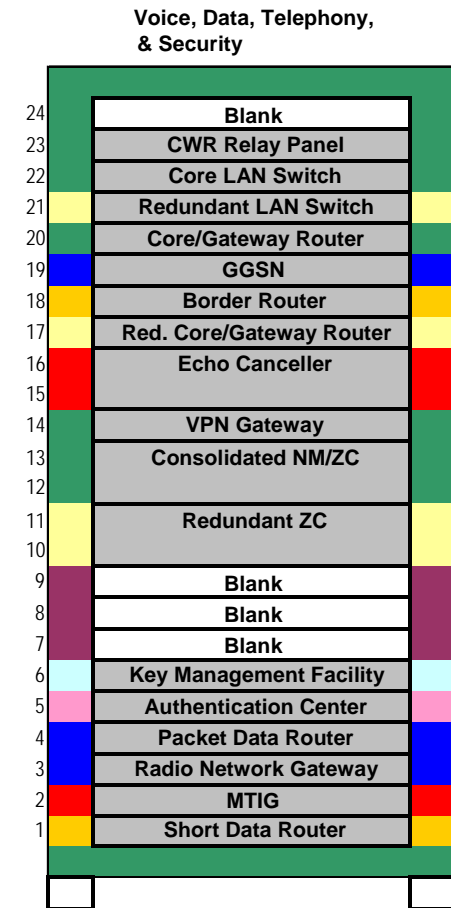
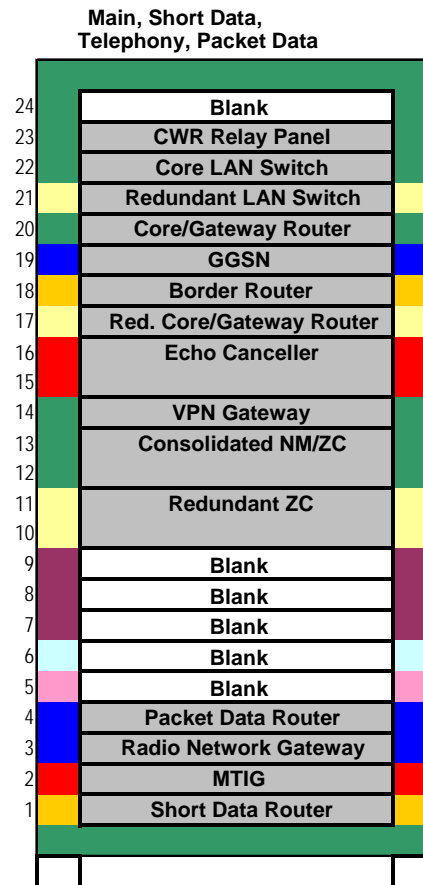
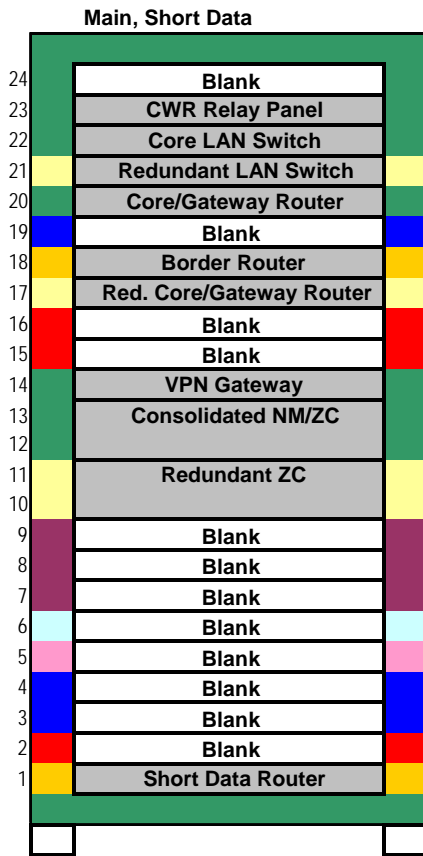
Start with the basics...

Modular approach allows customer to select basic voice services, adding services when required

Enhanced rack comes pre-configured to allow simple addition of new services



..and grow as you require



Features

Features

- **Dimetra IP Compact R1.0 is based on the certified Dimetra R6.0 SER**
- **Additional features include:**
 - Improved Serviceability
 - Simpler Backup and Restore
 - Restoration Procedures

Serviceability

- **Additional serviceability functions included in order to enable easier remote service:**
 - VPN Gateway – service connection via the Internet
 - VPN Client needed for service personnel
 - Remote desktop to NM Client
 - **Access to all applications, just as sitting in front of the NM Client**
 - **Various service applications also available on the NM Client**
 - Access to iLO port on HP servers via Internet Explorer
 - Access to Echo Cancellor via IP connection (possible via Tellabs Craft Station application)

Backup and Restore

- **No backup on tapes**
- **Backup collector application on NM Client (for ZDS, FVS, ZSS, ZC, SDR, and PDR)**
- **Shared directory on NM Client for AuC and KMF backup**
- **TESS and Software Download application for MTS configurations**
- **Network Config Tool for router and switch configurations**
- **Backup stored on NM Client disk can be written on DVD for off-site storage**

Restoration

- **For box replacement, all components can be restored following procedure in manual**
 - The restoration procedure is also the planned method for future software upgrades
- **Network Configuration Tool for loading configurations into all switches and routers**
 - Motorola factory and service personnel can also create new configuration files
- **For easy installation, the Netra 240 is installed via a single DVD**
- **For easy installation, the NM Client PC is installed via a single DVD (plus a backup DVD with the backup data)**

Architecture and HW

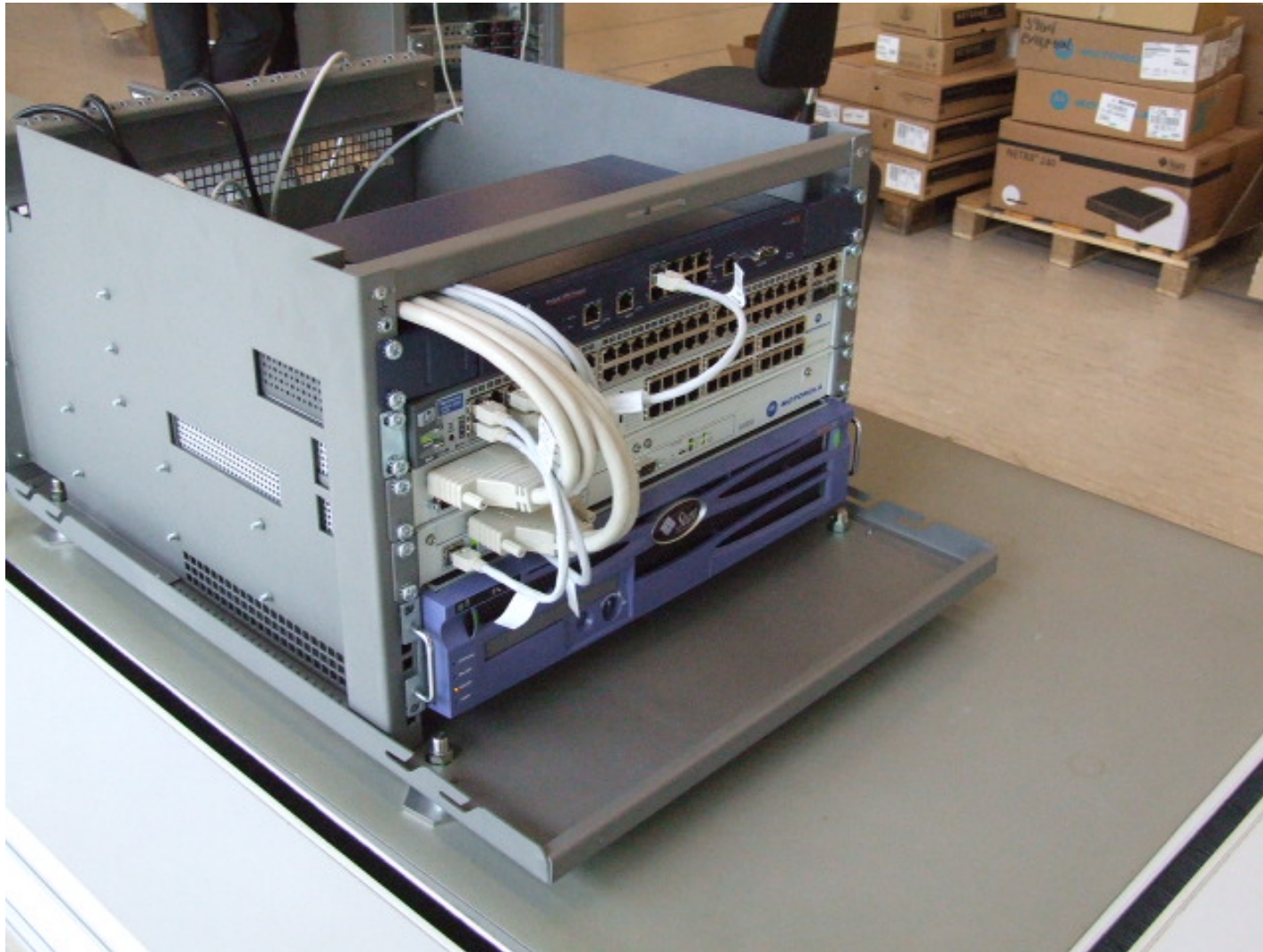
System Architecture - Overview



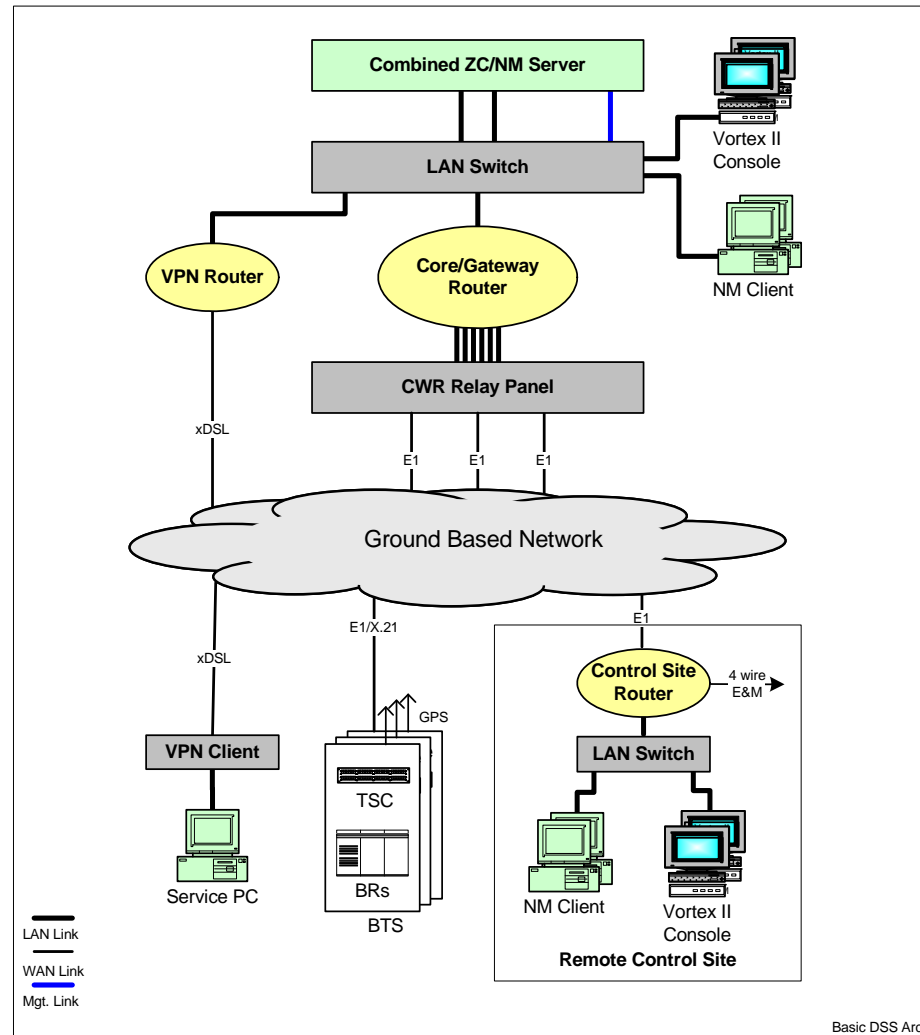
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System Architecture - Core



System Architecture - Core



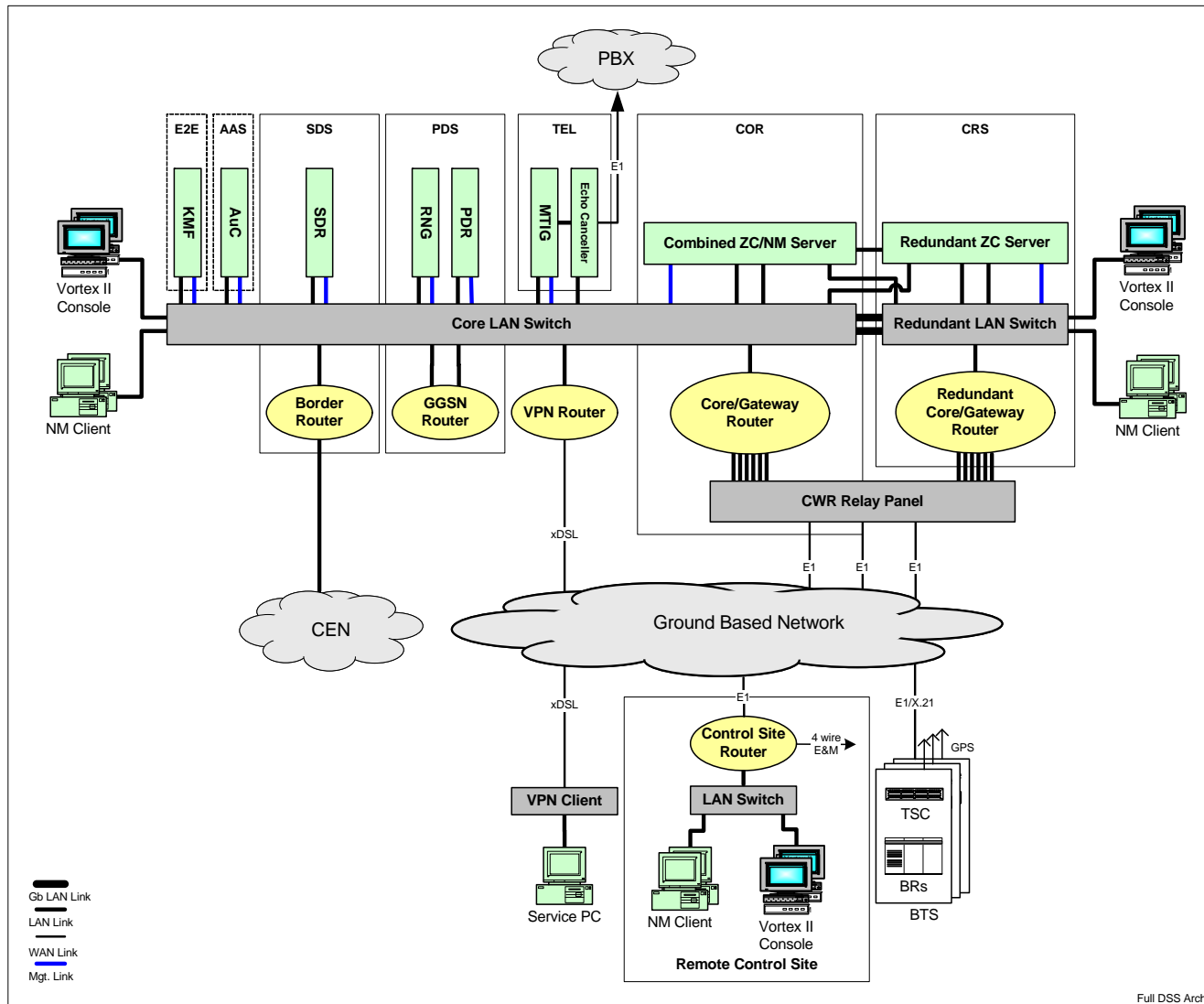
Dimetra IP Compact – Core

- **Small cabinet with core functionality only**
 - Smallest size central switch
 - Voice only operation
 - Please note: Can not be expanded with other options (like short data, packet data, etc.). Select the big cabinet if future expansions are expected.

System Architecture - Full



System Architecture - Full



Dimetra IP Compact – Full

- **Big cabinet supports all functionality**
 - Core equipment must be included
 - Other parts are optional:
 - **Short Data**
 - **Packet Data**
 - **Telephony**
 - **Authentication/Air Interface Encryption**
 - **Key Management Facility (KMF) to support End-to-End encryption**

Combined ZC/NM Server

Part of Core Equipment

- **Platform: Sun Netra 240**
- **Solaris 10 and Solaris Container technology**
 - Enables multiple servers running on a single physical server
 - Zone Controller placed in “global zone” with real-time priority
 - NM (ZDS, FVS, ZSS, UCS) and ATR placed in “local zones” with minimum percentage of CPU performance

Core/Gateway Router

Part of Core Equipment

- **Platform: Motorola MNR S6000**
- **Core and Gateway router combined into a single MNR S6000 router**
 - 12-port E1 card
 - Fractional E1 supported to RF Sites and Console Sites
 - Works together with Cooperative WAN Router (CWR) Relay Panel

Core LAN Switch

Part of Core Equipment

- **Platform: HP Procurve 2650**
- **Provides connectivity to the Combined ZC/NM Server and the Core/Gateway Router**
- **Provides connectivity to components like Short Data, Packet Data, Telephony, etc.**
- **Local NM Clients and local Dispatch Consoles can be connected here**

VPN Gateway

Part of Core Equipment

- **Platform: Netgear FVX538**
- **Enables fast and secure connection for service purposes**
 - Provides VPN connection via the Internet
 - Dedicated hardware client (Netgear FVS114) needed for service personnel
 - Process for creation, storing, and retrieving unique credentials is currently being defined between factory, service, and development engineering
- **Requires xDSL connection at the customer location**
 - Minimum 128 kbps in both directions
- **Provides service access to NM Client via Remote Desktop**
 - Access to all applications, just as sitting in front of the NM Client
 - Various service applications also available on the NM Client

NM Client PC

- **Platform: HP xw4400 workstation**
- **Windows XP and all applications are installed using a single DVD**
- **Remote access to NM Client available via Remote Desktop**
- **Access to other Windows boxes via Remote Desktop from NM Client PC**
- **Various network management related applications available on the NM Client:**
 - PRNM and STM Suite – NM/ATR applications
 - TESS – TETRA EBTS Service Software (also for MTS)
 - Backup Collector
 - DVD Burning application
- **Various service applications available to Motorola service personnel:**
 - Various service applications available on the NM Client
 - Access to iLO port on HP servers via Internet Explorer
 - Access to ALOM port on Netra servers via telnet
 - Access to Echo Canceller via IP connection (possible via Tellabs Craft Station application)
 - Ethereal network protocol analyzer

Remote Console Site

- **Platform: Motorola MNR S2500 as Control Site Router**
 - Supports a single E1 link towards the central MSO
 - Conventional Channel GateWay (CCGW) interface is optional
- **Platform: HP Procurve 2626 as Control Site Switch**
 - Connects the Control Site Router with the equipment on the Control Site

Remote RF Site

- **Platform: Motorola MTS-2 and MTS-4**
- **Platform: Motorola EBTS and MBTS (non-EU)**
 - Same equipment/software as in Dimetra R6.0 SER
 - Fractional E1 supported
 - X.21 also supported, however only E1 is supported towards the CWR
 - EBTS/MBTS supported for non-EU shipments until 800 MHz MTS is available

Short Data Router (SDR)

Part of Short Data Option

- **Platform: HP ProLiant DL360 G4p**
- **Additional service access to diagnostics ports – integrated Lights Out (iLO) (similar to ALOM on Netra 240)**
 - Aimed at Motorola service personnel for troubleshooting purposes

Border Router

Part of Short Data Option

- **Platform: Motorola MNR S6000**
- **Only Ethernet interface support (no WAN connection)**
- **Includes simple firewall**
- **Provides access to APIs like ATIA and CADI**

Motorola Telephone Interconnect Gateway

Part of Telephony Option

- **Platform: HP ProLiant DL360 G4p with Voice and E1 card**
- **Additional service access to diagnostics ports – integrated Lights Out (iLO) (similar to ALOM on Netra 240)**
- **Only a single E1 line is supported**

Packet Data Router (PDR)

Part of Packet Data Option

- **Platform: HP ProLiant DL360 G4p**
- **Additional service access to diagnostics ports – integrated Lights Out (iLO) (similar to ALOM on Netra 240)**

Radio Network Gateway (RNG)

Part of Packet Data Option

- **Platform: HP ProLiant DL360 G4p**
- **Additional service access to diagnostics ports – integrated Lights Out (iLO) (similar to ALOM on Netra 240)**

System Features and Functions



Voice Calls Review

Group-Based Calls

- Talkgroup calls
- Announcement calls
- Emergency calls
- DMO group/emergency calls
- Site-wide calls

Individual Calls (Semi-Duplex or Full-Duplex)

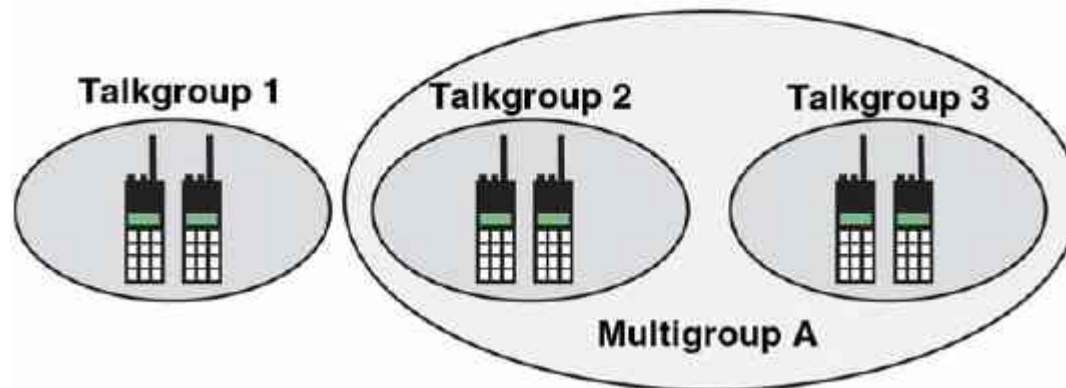
- Private calls
- Telephone Interconnect calls



Talkgroup Calls



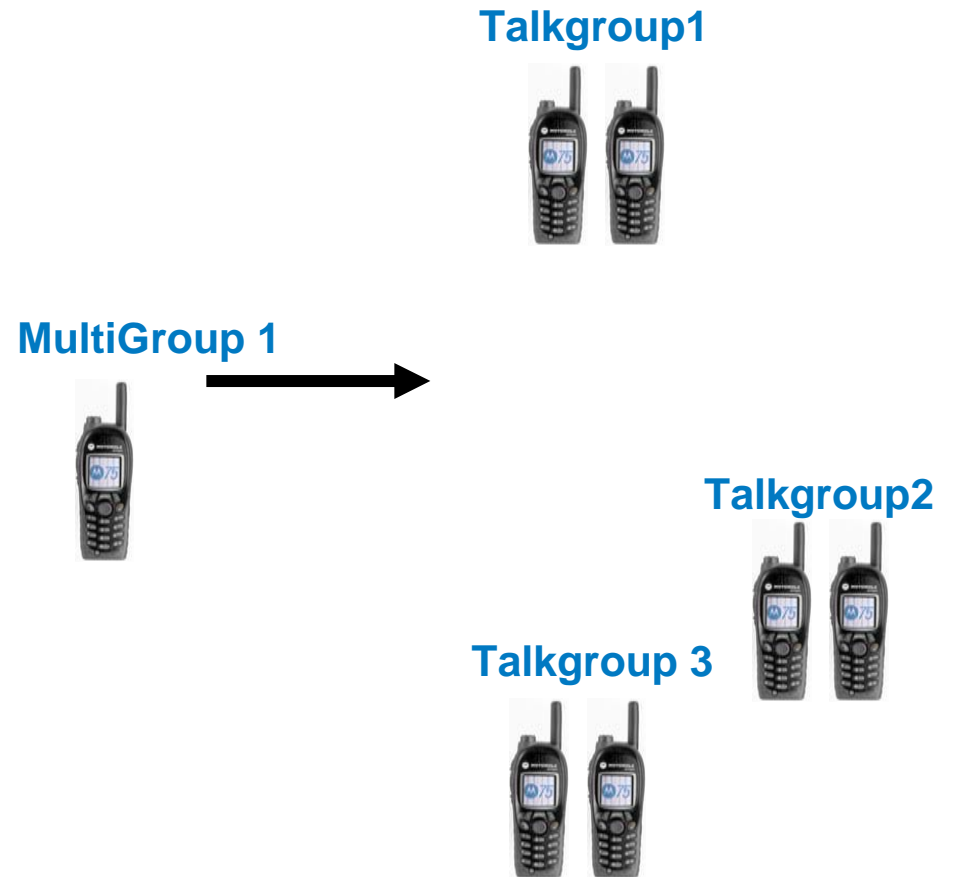
- Talkgroups are a collection of radio users who communicate with one another.
- Talkgroup calls are semi-duplex.
- Several talkgroups can be combined to form a multigroup. Multigroups are assigned an ID from the same pool of numbers as the talkgroups.



Reference: [Understanding your System – Page 1- 14](#)

Announcement Call

- Able to communicate with multiple talkgroups simultaneously
- Uses the Group Call service



Reference: Understanding your System – Page 1- 14

Emergency Call

- An Emergency call is an Alarm sent to the displayed Range and Talkgroup.
- Upon entering Emergency Mode, the handset will automatically send an Emergency Alarm to the Dispatch Console.



Reference: Understanding your System – Page 1- 14

Group Mode Operations

- Group mode can operate either in Trunked Mode Operation (TMO) or Direct Mode Operation (DMO).
- In TMO the Mobile Station (MS) is used with the infrastructure services within system coverage.
- In DMO the mobile station can be used without infrastructure services being required.



Individual Calls

- Individual call is also known as a Private Call
- Allows MSs and Dispatch consoles to initiate and receive semi-duplex or full duplex individual calls
- Full Duplex speech can be used in three ways
 - Mobile to Console
 - Console to Console
 - Mobile to Mobile



Reference: Understanding your System – Page 1-15

Telephone Interconnect

- Gives full duplex communication between a MS and Private Automatic Branch Exchange (PABX) or Public Switched Telephone Network (PSTN) user and vice versa.



Reference: Understanding your System – Page 1- 15

Data Services

- Status Message
- Emergency Alarm
- Short Data Transport Service
- Alphanumeric Text Service
- Packet Data Service



Busy Call Handling



Priority Levels

- Level 1 highest (reserved for emergency calls)
- Level 2-10 (level 10 is default priority)

Reference: Understanding your System – Page 6- 40

Supplementary Services

- Selective Inhibit
- Queuing Priority
- Recent User Priority
- Dynamic Site Assignment
- Valid Sites
- All Start/Fast Start



Supplementary Services



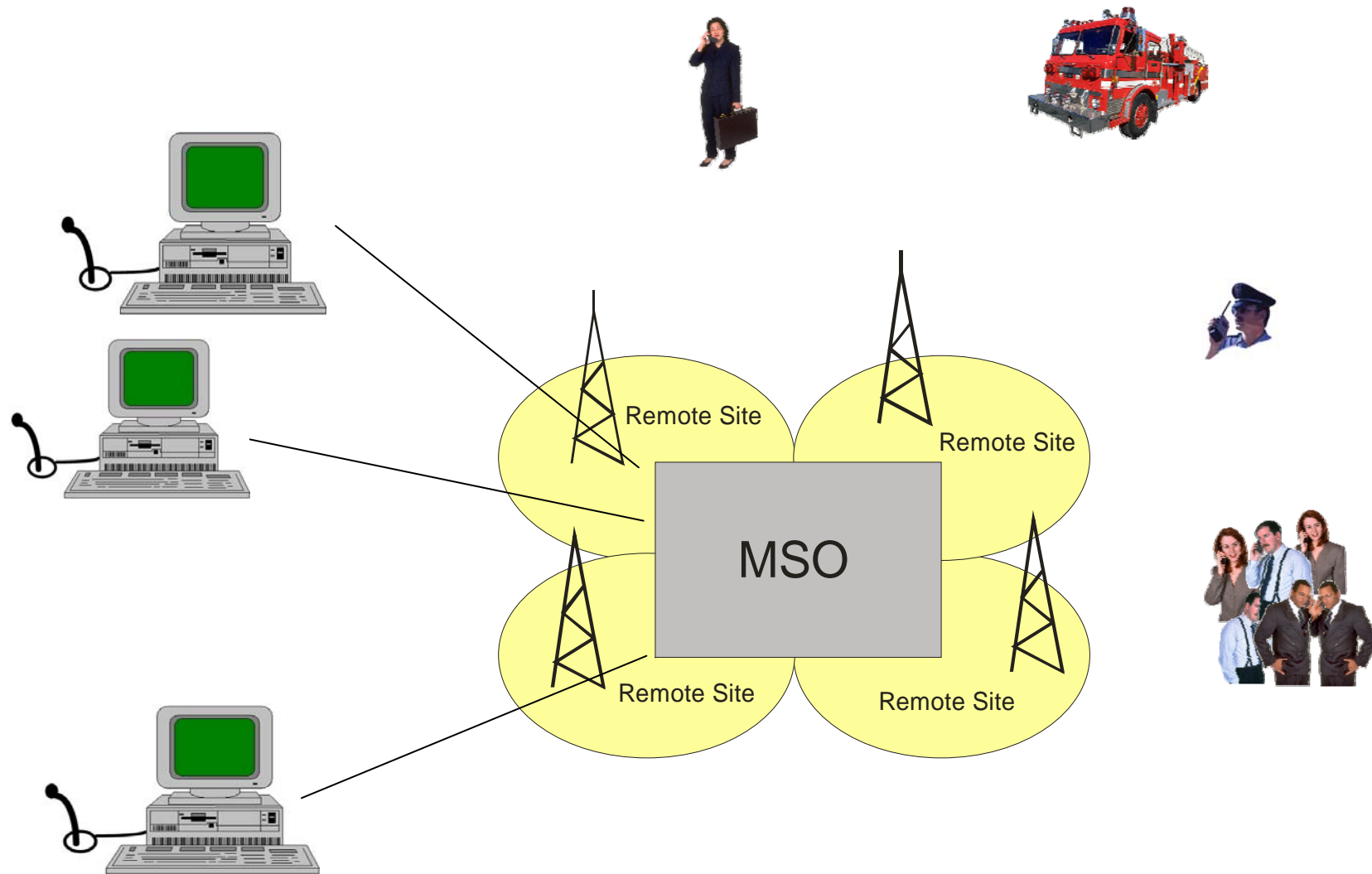
- Calling Line Identification Presentation
- Dual Tone Multi-Frequency Overdial
- Late Entry
- Priority Monitor
- Pre-emptive Priority Call
- Pre-emptive Priority Call - Busy user pre-emption

Supplementary Services

- Barring of Incoming Calls
- Requested Sites
- Central Voice Logging (Group Call only)
- Local Voice Logging (Group Call only)
- Critical Site Assignment
- Talking Party Identification

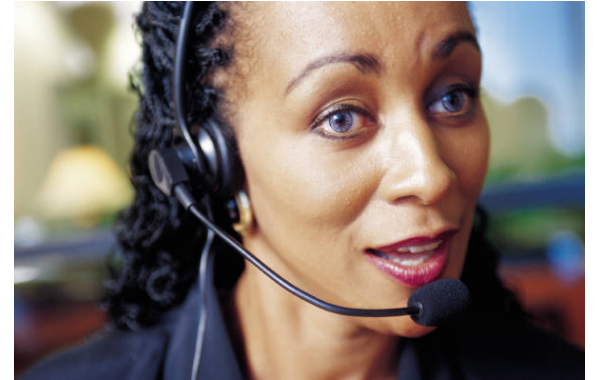


Console Operation



Console Operator Features

- Assignable Talkgroups
- Assignable Speakers and Audio Summing
- Group Call Operation
- Repeat Disable
- Private Call Operation



Console Operator Features

- Console Priority
- Emergency Operation
- Status Message Display
- Safety Switch
- Console Intercom Call



Console Operator Features

- Console Multi-Select
- Console Patch
- Conventional Channel Patch
- Ambience Listening



Console Operator Features

- Radio Control Manager Features
- Emergency Alarm Event Monitor
- Radio Check
- Snapshot
- Zone Status
- Selective Inhibit
- Dynamic Regrouping

