

# Visara

## Master Console Center

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## Administration Guide

P/N      707130-001

## **Technical Support**

### **Contacting the Visara Intellicenter**

For US domestic customers, Visara provides technical support through its Intellicenter, 8:30 - 5:00 (ET) Monday through Friday at 888-542-7282.

Calls outside these hours are handled by automatic pager, so expect a delay. You can also call through our switchboard at 919-882-0200. For support outside the US, please contact the company that has sold the product to you.

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# Chapter 1 Introduction

This chapter discusses:

- The purpose of this guide.
- Users of this guide.
- Organization of this guide.
- Manual conventions used.
- Starting the MCC.
- Restarting the MCC.
- Shutting down the MCC.

## Purpose of This Guide

This guide describes how to administer the Master Console Center (MCC).

## Users of This Guide

This manual is primarily intended to be read by the administrator of the MCC. The following list details the skills and experience required by the administrator:

- Trained in MCC use and administration.
- Unix experience, preferably Linux.
- Basic network concepts and administration knowledge.
- X-windows familiarity.
- Hardware administration knowledge (if MCC server is installed).

The following list highlights the administrator's main responsibilities:

- Act as primary contact for MCC support between VISARA and customer.
- Interact with various Enterprise systems administrators of legacy, distributed, and network systems.
- Assign and create MCC users and login users. Create and maintain security groups. Assign users to security groups.
- Change MCC user passwords and privileges.
- Start and restart the MCC system.
- Shut down the MCC system.
- Back up the system.
- Manage MCC configuration files.
- Test and implement scripts.
- Log file maintenance.
- Troubleshooting.
- MCC software and maintenance.
- License key administration.
- Configure MCC X-terminals.
- Set up and modify OS groups.
- Set up and maintain SNMP, if required.
- Set/reset MCC date and time.

## Organization of this Guide

This guide is organized into the following chapters:

Topic	Page
Chapter 1 Introduction discusses the purpose of this guide, users of this guide, manual conventions, starting, restarting, and shutting down the MCC.	11
Chapter 2 Administering the License Key describes how to install and maintain the license key that is required for the MCC to function correctly.	21
Chapter 3 MCC Terminal Configuration discusses setting up and customizing the MCC terminal.	25
Chapter 4 MCC Configuration File Management discusses the MCC system configuration files, and describes how to edit them to customize MCC operation.	41
Chapter 5 MCC system.cfg Configuration File describes the system.cfg file and how to edit it for the monitored systems.	77
Chapter 6 Defining and Changing OS Groups discusses how to create and edit Operating System groups.	105
Chapter 7 Setting Up SNMP discusses how to configure the MCC to use SNMP, including agent definition, group agent definition, configuring SNMP, and SNMP from scripts.	109
Chapter 8 Administering Users discusses how to create or remove MCC users, and administer user security.	119
Chapter 9 Managing and Editing Events with Event Manager discusses the Event Manager, how to edit events, modifying Event Manager rules, parameter substitutions for console messages, and time events.	139
Chapter 10 Maintaining Log Files describes how to view and interpret logs via Unix command lines and descriptions of log files.	165
Chapter 11 Backing Up and Restoring MCC Software discusses backing up and restoring scripts and data files.	185
Chapter 12 Setting MCC System Date and Time discusses setting the data and time as well as changing the time zone.	189
Chapter 13 Printing from the MCC discusses how to configure the MCC to print files.	193

Chapter 14 Remote Access to the MCC discusses the gwcharcons facility which enables dial-in and telnet access to the consoles configured in the MCC.	199
Chapter 15 Troubleshooting discusses problems that may occur, and tools and techniques for recovering the system.	205
Chapter 16 Integrating Other Products with the MCC discusses integrating Ataman Telnet and BMC PATROL with the MCC.	215
Appendix A Valid Color Names discusses the colors and RGB values.	218

## The MCC Documentation Set

In addition to this manual, you may need to refer to other manuals in the MCC documentation suite. These are:

- **Software Installation Guide.** Provides instructions for the initial installation and configuration of the MCC software.
- **Getting Started.** Contains an initial overview of the MCC, and its applications.
- **Operations Guide.** Contains procedures for day-to-day operation of the MCC, including selecting consoles, and managing alerts and messages.
- **Scripting Guide.** Describes how to write scripts in GCL (Global Control Language).
- **Installation Preparation Guide.** Contains information on how to install MCC hardware, and prepare mainframes and servers to communicate with the MCC.
- **Troubleshooting Guide.** Provides initial troubleshooting steps to take before contacting Technical Support.

## Manual Conventions

The names of menus, menu options, and window controls are in bold type. Also, text that you type is a different font. For example:

Type `boot` and press the **Return** key.

Text that is placed within the `<>` symbol should be replaced (including `<>`) with the appropriate text. For example:

`<ipaddr> <hostname>`

`ipaddr`                   Substitute the MCC system's IP address.

`hostname` Substitute the MCC system's host name.

## Starting the MCC

To start the MCC:

*Note:* If starting a “software only” MCC, only step 5 is applicable.

1. Power on the MCC server and monitor, and let it boot up.

Wait for the “login” prompt. When this prompt appears, the MCC is fully started and the MCC core programs are executing. The MCC programs automatically start when the system boots. Even if a user is not logged, the interfaces are active, auto-starting scripts are launched from the `#startup` script, and scheduled scripts are executing. Logging in enables the display of, and interaction with the MCC.

2. Power on the MCC user console (the ThinClient / workstation / X terminal). Ensure the monitor's power is also on.
3. Login at the X terminal or Linux Console to use the MCC.

## Restarting the MCC Software

For any changes to the configuration take effect, the MCC software must be shutdown and restarted.

To “cycle” all of the MCC software, including the core programs:

1. All users should logout except for one with shutdown authority (an administrator).
2. Shutdown the MCC software by selecting the Administration menu Shutdown option on the user display.

This stops all MCC programs, including the core MCC programs.

*Note:* To only logout of the interactive user display, not the MCC system, choose the **Logout** option from the **User** menu.

3. When the MCC login window reappears, login as any user. This will also automatically start the MCC core programs.

To “cycle” only the MCC user interface programs:

1. Logout of the system by selecting the **Logout** option on the user display.
2. Login again.

## Shutting Down the MCC

Rebooting the MCC is rarely necessary. Changes to the MCC configuration require a MCC software restart only. Generally, the MCC is powered down only for hardware installation, hardware maintenance, or to physically relocate the MCC CPU.

### Before Shutting Down the MCC

The administrator should follow the following procedure before shutting down the MCC:

1. To make sure all programs are closed on the system, use `'bin/icsmaster -x'` to see if there are any problems.
2. Use `'bin/icsmaster -X'` to shut down any programs.
3. Use `'bin/icsmaster -x'` to verify the system is clear to shut down.

For more information about `icsmaster`, see `ICSMMASTER` on page 208.

### Full Shutdown of the MCC

To do a full MCC shutdown and power off:

1. Shutdown the X terminals, or Linux X Desktop:
  - a. Vary all host consoles off-line (mainframe interfaces).
  - b. Shutdown the MCC software by selecting the **Administration** menu **Shutdown** option on the user display. This option stops all MCC programs, including the core MCC programs.

<p><i>Note:</i> To log out of the interactive user display only, choose the <b>User</b> menu <b>Logout</b> option.</p>
--

- c. Wait for the XDMCP menu to be displayed.
  - d. Power off each MCC user console.
2. Shutdown the MCC CPU from the MCC system console:
  - a. Login as root, or obtain root permissions.
  - b. Enter the command `shutdown -h now`. Alternatively, enter `/usr/sbin/shutdown -h now` if `/usr/sbin` is not in your path.
  - c. Wait for the system monitor to prompt you to power down.
  - d. Power off the CPU.

*Note:* If you are going to turn the CPU back on again at this point, wait at least 60 seconds. This allows time for all of the internal devices to reset.

3. Power off all remaining equipment, for example, the system console, and switches.
4. Power off the power supply unit.

## Structure of the MCC Directories

All of the subdirectories for the MCC are located in `/usr/ics/`. Some of the subdirectories include:

- **Config**, which contains the configuration files.
- **Bin**, which contains the executable programs.
- **Script**, which contains the scripts.
- **Log**, which contains the MCC-generated log files.
- **Etc**, which contains manuals and utilities.



## Chapter 2 Administering the License Key

The MCC software requires installation of a license key file on your system before it can run. The file is customized for a specific site and machine, and cannot be used elsewhere. In certain cases (for example, evaluation copies), the license is only valid for a limited period, and the MCC software will cease to operate if the license is not renewed. The MCC can be shut down if the license has expired, but it will not be possible to restart it. New and replacement license files can only be obtained from Visara.

### Understanding the License Key File

As part of the MCC installation package, Visara supplies a file called `license.cfg`. This is copied into the directory `/usr/ics/config`. A typical license key file is shown below.

```
seed=xyz company
MCCExpires=2006-12-23
BMCExpires=NEVER
MaxMCCUsers=10
MaxAllowedEBusConsoles=600
MaxAllowedIConConsoles=600
MaxAllowedTelnetConsoles=600
MaxAllowedCommandConsoles=600
MaxAllowedTN3270Consoles=600
MaxAllowedTN5250Consoles=600
MaxAllowedMCCStarsConnections=600
MCCKey=2e68092f4d36324a682a51605e7e46317d6a587b1199163468183e56245f
BMCPatrolKey=3a4c300b68364e3877291c3e5e0246683412
```

where:

`seed` is a string that was used to generate the `MCCKey` field. This must be a minimum of eight characters. It is typically the customer's name.

`MCCExpires` is the expiration date of the MCC software. If this is "NEVER", the license has no expiration date. If this field contains a date in the format `YYYY-MM-DD`, this is the date on which the license expires.

`BMCExpires` is the expiration date of the BMC Patrol option. It may contain "NEVER" or a date in the same format as `MCCExpires`.

`MaxMCCUsers` is the maximum number of users that can log in to the MCC at the same time.

`MaxAllowedEBusConsoles` specifies the maximum number of EBus card ports.

`MaxAllowedIconConsoles` specifies the number of Visara Icon 5250 consoles that are allowed.

`MaxAllowedTelnetConsoles` specifies the number of telnet consoles allowed.

`MaxAllowedCommandConsoles` specifies the number of command consoles allowed.

`MaxAllowedTN3270Consoles` specifies the number of 3270 sessions or consoles allowed.

`MaxAllowedTN5250Consoles` specifies the number of TN5250 sessions allowed.

`MaxAllowedMCCStarsConnections` specifies the number of MCCStars LPARs allowed.

`MCCKey`. The public license key required for the MCC software to run on the specific machine.

`BMCPatrolKey`. The public license key required for the optional MCC BMC Patrol integration software to run on the specific machine.

**WARNING:** If any field in this file is edited inappropriately, the MCC will no longer function.

## Renewing an Expired License

When the license expires, a warning message is displayed every four hours in the execution log window, indicating the number of hours the MCC will continue operating. After three days, the MCC system shuts down, and will not function until a `license.cfg` file containing a valid expiration date and license key is installed, and the MCC system restarted. Any users who attempt to log into the MCC from the MCC terminal or `gwcharcons` will receive a message that the MCC is unavailable because the license has expired.

To keep running the MCC, contact Visara Technical Support as soon as possible for a new license key. Visara will send a new `license.cfg` file, which must be installed on the system in place of the expired file, within three days of the previous expiration date.

**WARNING:** Do not change the expiration date or license key number in the expired `license.cfg` file, or the MCC will prevent other users logging in. Also, the MCC will not restart if shut down. Always copy the complete `license.cfg` file as supplied by Visara.

### **If the License Key is Invalid or Expired**

If the MCC cannot start because of an invalid or expired license key, error messages appear in two locations, stderr, and the log/icsexec.log file.

The startup script also displays a dialog window "MCC license is not valid" when the program cannot be started for one of these reasons.

Contact Visara Technical Support immediately to resolve the problem.



## Chapter 3 MCC Terminal Configuration

This chapter discusses:

- Setting up the MCC Terminal.
- Customizing the MCC Terminal.
- Displaying hosts on the XDMCP.
- Disabling the pickup of other servers on the same network.
- Having an X terminal monitor which gateway to use.
- Having multiple xp.cnf configuration files.
- Specifying primary and secondary boots.
- Using X Terminal emulation software.

## Setting up an X Terminal

To setup the X terminal:

**Caution:** The X Terminal monitor weighs over 70 lbs.

2. Follow the manufacturer's installation instructions included with unit for correctly cabling the unit.
3. Power on the monitor and the base unit.
4. While the blue boot screen is displayed, press the space bar to stop the X terminal from attempting to boot. If this is not successful, power off the X terminal and retry. The `BOOT>` prompt appears. Enter the information from steps 6 through 14 and 16 at this prompt. Use the `?` key for help; note the `"re"` command will list some current settings.
5. Enter  

```
ia X.X.X.X
```

where `X.X.X.X` is the IP address for the terminal. Define this IP address in your MCC host server's `/etc/hosts` file, or the server will not recognize the X terminal and will not allow it to boot.
6. Enter  

```
ih Y.Y.Y.Y
```

where `Y.Y.Y.Y` is the IP address of the MCC server. Ensure you can successfully ping `Y.Y.Y.Y` before doing an NVS (in step 14). If not, the X terminal will hang on boot.
7. Enter  

```
im K.K.K.K
```

Alternatively it is possible to enter the appropriate subnet mask.
8. To set IP address of a gateway (router for T1), enter `ig Z.Z.Z.Z` only if one exists. Ensure the gateway can be pinged before you do an NVS.
9. Set the X software to execute (set the boot path). For X terminal Model XP400, use the following settings:
  - **Ethernet X terms:** `bp /usr/tekxp/boot/os.350`
  - **Token Ring X terms:** `bp /usr/tekxp/boot/os-tr.350`
  - **X terminal Test Menu:** `bp /usr/tekxp/boot/selftest.350`
  - For X terminal Model NC400, use the following:
    - **Ethernet X terms:** `bp /usr/tekxp/boot/os.500`

- **Token Ring X terms:** No option available.
  - **X terminal Test Menu:** bp /usr/teexp/boot/selftest.500
10. Set the boot method:
    - Normal: bm nfs 8192
    - Over shared (congested) or small fractional T1: bm nfs 1024
  11. The default and recommended resolution is 1600 x 1280. The following resolutions are available, but not recommended or supported by VISARA:

Monset Value	Resolution	Frequency
55	1600 X 1280	65 Hz
54	1600 X 1200	69 Hz
53	1600 X 1188	70 Hz
56	1280 X 1024	80 Hz

*Table 1 X Terminal Monitor Settings*

- Use the command `se monset xx` to change the resolution (xx = monset value in the table).
12. Enter k to start the keyboard selection utility. Use the space bar to select the 3270 keyboard and North America as the location. Press the **Enter** key when finished.
  13. If satisfied with all settings, type NVS. This will save the settings to non-volatile RAM.
  14. Add an entry to /etc/hosts for the X terminal in the MCC server. The X terminal reads its boot files from the MCC server via the Network File System (NFS). NFS has simple security that attempts to validate the IP address of the NFS requestor before allowing the NFS mounting to occur. Therefore, the MCC server requires an entry in /etc/hosts or the Domain Name System (DNS) to resolve the IP address.
  15. Enter b to boot the X terminal.
  16. Once the X terminal has booted and the XDMCP menu screen is displayed, adjust the picture (width, height, centering, etc.) by pressing 1 on the monitor control panel (for Tektronix models) and selecting the correct on-screen options.
  17. Press the right **Alt** and **Set Up** keys simultaneously to access the Tek setup menu. Click the **Setup** option on the window that appears.

18. Click the **Configuration Summaries** option. A drop-down list appears. Select the **X Environment** option. Confirm the following settings:
  - a. Retain X Settings: NO
  - b. Host Connect Method: XDMCP Direct
  - c. Enter your server name in the **XDMCP Server** text box:
19. Click the **Return to Main Menu** button.
20. Click the **Network Tables and Utilities** button. A drop-down list appears. Select the **NFS Mount** option.
  - a. Enter `<MCC>:/usr` in the **File System Name** text box. Substitute your server name for `<MCC>`.
- b. Enter `/usr` in the **->Local Directory** text box. Click the **Add Table Entry** button.
  21. Click the **Return to Main Menu** button.
  22. Click the **Save Settings to NVRAM** button.
  23. Click the **Exit setup** button.
  24. Reboot the X terminal.

## Customizing the MCC Terminal

It may be necessary to customize the MCC terminal settings for each installation site if for example:

- Multiple locations are involved in the configuration.
- The MCC servers are on subnets other than the MCC terminal's.

The config file for the customizations is `/usr/tekxp/boot/config/xp.cnf`.

Each section in the file contains all of the instructions provided by Tektronix.

Enable the following settings in `xp.cnf`:

Setting	Value
<code>retain_x_settings</code>	NO
<code>screen_saver</code>	OFF
<code>keyboard_type</code>	3270

*Table 2 xp.cnf MCC Terminal Settings*

The following sections outline the customizations that may be required. For additional explanation, refer to the appropriate section in the `xp.cnf` configuration file (described later in this Chapter).

### Displaying Hosts on an XDMCP Menu Through a Router

There are two methods for displaying MCC servers listed on the XDMCP which span routers. Both methods require hardcoding MCC hostnames and IP addresses in configuration files:

- Editing the `HOSTS.TBL`, `GATEWAY.TBL`, and the `XP.CNF` files. This is the recommended method.
- Editing the `XP.CNF` file only.

#### **Recommended Method**

This is the easiest and least complex way of displaying all MCC servers listed on the XDMCP list. It is accomplished by editing the following three files, all of which reside in the `/usr/tekxp/boot/config` directory:

- `HOSTS.TBL`
- `GATEWAY.TBL`
- `XP.CNF`

The `hosts.tbl` should contain a list of all MCC servers and their IP addresses. Use the following syntax:

```
<ipaddr> <hostname>
```

where <ipaddr> is the MCC system's IP address, and <hostname> is the MCC system's host name.

The gateway.tbl should contain a list of all gateways (routers) at all sites in the organization. Each gateway definition contains the target network address and the IP address of the gateway to use for that network, in the following format:

```
<network addr> <ipaddr>
```

where <network addr> is the network address of the remote network (for example, 200.100.50.0) and <ipaddr> is the IP address of the gateway to this network (for example, 192.168.11.254).

The xp.cnf file contains a section titled TekHostMenu. In the TekHostMenu section, all of the MCC server names should be listed, using the following syntax:

```
xdmcp_menu_entry <hostname>
```

where <hostname> is the MCC system's host name.

### **Alternate Method**

This requires the hardcoding of the MCC hostnames and IP addresses in the Tek config file /usr/tekip/boot/config/xp.cnf, as outlined in the steps below.

1. Define the hosts, by adding IP Host Table entries in the network cfg using the following syntax:

```
ip_host_table <ipaddr> <hostname>
```

where <ipaddr> is the MCC system's IP address, and <hostname> is the MCC system's host name.

*Note:* Using this type of entry, there is a limit of four XDMCP menu selections—the storage limit of NVRAM. Alternately, the following line can be used:

```
ip_host_entry <ipaddr> <hostname>
```

This places the hosts in RAM, providing for a virtually unlimited number of menu selections.

2. Define the gateways by adding Gateway Table entries in the network.cfg section using the following syntax:

```
gateway_table <0.0.0.0> <gatewayipaddr>
```

where <gatewayipaddr> is the IP address of the gateway.

3. Define the menu entry by adding the XDMCP section in the TekHostMenu cfg section:

```
xdmcp_menu_entry <hostname> PREFERRED
```

where <hostname> is the system's host name, and PREFERRED (optional) causes the specified MCC system to always be at the top of the list.

## Disabling Picking up of Other Servers on Same Network

When the Tektronix X Terms are on a corporate network and other servers undesirably appear on the Tek Host Menu, use the following entry to disable the pickup of other servers:

```
THM_BROADCAST=DISABLED
```

*Note:* Hard code all MCC servers in the xp.cnf file if you do this.

## Having Multiple xp.cnf configuration Files

In an installation with multiple MCC networks, the following issues necessitate separate configuration files based on location:

- Secondary boot host (primary is specified by monitor cmds). See *Specifying Primary and Secondary Boot Hosts* on page 32.
- Network gateways.

The xp.cnf file is read by each X terminal when booting. Due to customizations, it may be necessary to create separate or specific configuration files for each location accessing a MCC server. The xp.cnf file will contain the generic information for all locations. Additional files will contain the information specific to each location. To do this, use one or more of the “select” & “include” commands in the xp.cnf file to include the appropriate specific files.

Example lines in a xp.cnf file based on criteria (for example, IP addresses or range of IP addresses), include the correct file (“select” & “include” commands):

```
include_host_access  " "      NFS
select SUBNET=10.2.50.46-62 include "/usr/tekxp/boot/config/xp.cnf.msp"
select SUBNET=10.2.50.78-94 include "/usr/tekxp/boot/config/xp.cnf.top"
select IPADDR=10.2.50.110 include "/usr/tekxp/boot/config/xp.cnf.ftw-msp"
select IPADDR=10.2.50.115 include "/usr/tekxp/boot/config/xp.cnf.ftw-msp"
```

An example xp.cnf.city file:

```
boot_method_2  NFS 8192
boot_host_name_2    "<ipaddr>"
boot_path_2        "/usr/tekxp/boot/os.350"
gateway_table  "0.0.0.0"  "10.2.50.33"
gateway_table  "0.0.0.0"  "10.2.50.34"
```

## Specifying Primary and Secondary Boot Hosts

The primary boot host is specified on the X terminal with the IH command. The primary host can also be specified in the xp.cnf file, but this is not recommended. If specifying an optional secondary boot host is possible, it must be specified in the xp.cnf file.

```
boot_method_2  NFS 8192
boot_host_name_2    '<ipaddr>'
boot_path_2      '/usr/tekxp/boot/os.350'
```

Only a maximum of two boot hosts can be specified, due to Tektronix software limitations. Consider putting site specific information in separate files. The “select” & “include” command combination can then be used to include the information specific to a site when the X terminal is booting. Also, remember to change the ip\_host\_table section if the entry is a host name instead of an IP address.

## Having an X Terminal Monitor Which Gateway (Router) to Use

An X terminal can monitor the gateway to use. To do this, first define the gateways, then run ROUTE\_MGR.

To define the gateways, use one of the following methods:

- Put a list of gateways IP's in the gateway.tbl file. This file can be created if it does not exist.
  - Advantages: “Unlimited” gateway list
  - Disadvantages: None stay in the X terminal's NVRAM
- Add gateway\_table entries in the xp.cnf file.
  - Advantages: Entries stay in the X terminal's NVRAM
  - Disadvantages: Maximum of four entries in the file

Make a gateway\_table entry in the following format:

```
gateway_table "0.0.0.0" <gatewayipaddr>
```

To run ROUTE\_MGR, make the following entries in the local clients section:

- Uncomment the “start ROUTE\_MGR” entry
- Change the ‘NO’ to a ‘YES’ to start it at boot time

## X Terminal Emulation Software

The MCC software is designed to work with the Tektronix X terminal. However, there are various software packages, such as Hummingbird Exceed, NetManage, and Reflections/X available for desktop PCs that allow the user to emulate X terminal function. Visara cannot guarantee the functionality of any third party X terminal emulation software with the MCC. However, some basic guidelines for configuring emulation software include:

- Set the PC to have a **minimum** of 1280x1024 resolution with 8-bit (256) color depth. Because of the amount of information the MCC displays on the screen, some cutoff can occur at lower resolutions.
- Make sure the emulation software has XDMCP broadcast information set appropriately. If the PC is on a subnet other than the MCC, it may be necessary to manually enter the MCC IP address.
- Some features (such as connecting to Tektronix WinDD servers) may not work with emulation software.
- Default font selections may have to be changed to avoid undersized or oversized text in some MCC windows. For example, in Reflections/X, set the font servers option to 100dpi misc, deleting other default selections. (Select the Settings — Fonts menu option to display the main X Client Manager, then make this entry in the subdirectories and font servers line.)

(Please inform Visara of any new problems or tips found with X terminal emulation software packages, so that we may update this guide.)

**Caution:** When using emulation software, ensure users log out from the MCC main menu before closing the emulation software. Performance problems may occur if the emulation software is closed without logging out.

## Using Exceed Emulation Software

### *Exceed with a 3270 Keyboard (122-key)*

A 3270 keyboard can be emulated with Exceed when used with the MCC.

Many of the PS/2 or AT style 3270 keyboards work with a PC running Microsoft Windows 3.x, 95/98, or NT without any significant problems. Available keyboards include Lexmark's IBM Host Connect 122, Memorex Telex 4100/4300, Keytronics KB3270 Plus 122, Irma IRMAkey/3270, and Nokia 122.

*Note:* Visara does not endorse any particular keyboard or manufacturer.

Microsoft Windows requires a keyboard driver for 122-key keyboards, which may be difficult to find. Windows does not ship with a 122-key driver, and may use the 83/84 XT keyboard driver as the default.

### **Configuring a 3270 Keyboard**

After installing the 3270 keyboard, test the special keys such as **PA1** and **ErEOF**. If they do not function correctly, check the following:

- Ensure the proper keyboard driver is installed in Microsoft Windows. The file is located in the Start-Settings-Control Panel-Keyboard-General directory.
- Ensure Exceed is using a 3270 Keyboard mapping. Check the Exceed-Tools-Configuration...-Input directory, and check the file is **us3270.kbf** or **mf3270.kbf**. If the correct file is not installed, both **us3270.kbf** and **mf3270.kbf** are supplied by Visara in the /usr/ics/examples/exceed/3270keyboard.zip file. To install the required file, copy the 3270keyboard.zip file to the Windows PC using FTP, then unzip the contents of the file into the Exceed user directory (typically, \Program Files\Exceed\user). The following files should be obtained:
  - us3270.kbf. Contains the mnemonic bindings to the keyboard scan codes, PC standard.
  - mf3270.kbf. Contains the mnemonic bindings to the keyboard scan codes, 3270 standard.
  - us3270.kbt. Contains the 122-key layout used in Exceed's graphical keybinding configuration program.

Make the required mapping active using the Exceed Exceed-Tools-Configuration...-Input menu option.

### **Customizing the Keyboard Layout**

The us3270 / mf3270 keybindings supplied by Visara can be reconfigured to individual requirements. Changes can be made through Exceed's keybinding facility, which is accessed through the Exceed-Tools-Configuration...-Input menu option.

*Note:* Exceed may display a message stating that "The Windows keyboard driver failed to recognize a key in this keyboard file. The key cap may display a scan code". This may be because Visara's 3270 keyboard driver is not from the same manufacturer as the 3270 keyboard driver, or because the PC does not have a 3270 keyboard driver installed. The message can be ignored.

**List of Significant Keybindings**

Scancode	Keycap	Exceed X Mapping
76	Clear	Clear
5A	PA1	F30
6D	ErEOF	F27

Table 3 Keybindings in both *us3270.kbf* and *mf3270.kbf* Files

Scancode	Keycap	Exceed X Mapping	101-key Keycap
07	6 / ¬	6 / (shifted) notsign	6 / ^
1A	¢ / !	cent / (shifted) exclaim	[ / {
1B	\ / ¦	backslash / (shifted) brokenbar	] / }
2B	{ / }	braceleft / (shifted) braceright	\ / ¦
56	< / >	less / (shifted) greater	No equivalent key

Table 4 Keybindings in *mf3270.kbf* File

<p><i>Note:</i> The period and comma keys, when shifted, produce only period and comma characters.</p>
--

**Implementation Notes****PS/2 Keyboards**

- **SysRq** is a *shadow key* of the **Print Screen** key. To access the **SysRq** key down event, the Alt (alternate) modifier must be down.
- **Break** is a *shadow key* of the **Pause** key. To access the **Break** key down event, the Ctrl (control) modifier must be down.
- **XShift** (extended shift) is a *virtual key* with a “E0 2A” key down sequence. It is used by the **Print Screen** key.

**3270 North American Keyboards**

- **NumLk** is a *shadow key* of the **ScrLk** key. Shift must be down to access the **NumLk** key down event.
- **XShift** (extended shift) is a *virtual key* with a “E0 2A” key down sequence. It is used by the **Print** key.

**Optimizing Exceed for Use with the MCC**

This section describes how to optimize Exceed’s settings for correct MCC operation. Illustrations are based on Exceed version 6.1, and may differ for other versions.

1. Disable the  button in the top right corner of the Exceed window, to prevent users from closing a console window without logging out correctly. Launch **xconfig** from the Exceed program menu, choose **Settings — System Administration**. Set the options in the resulting window as follows:

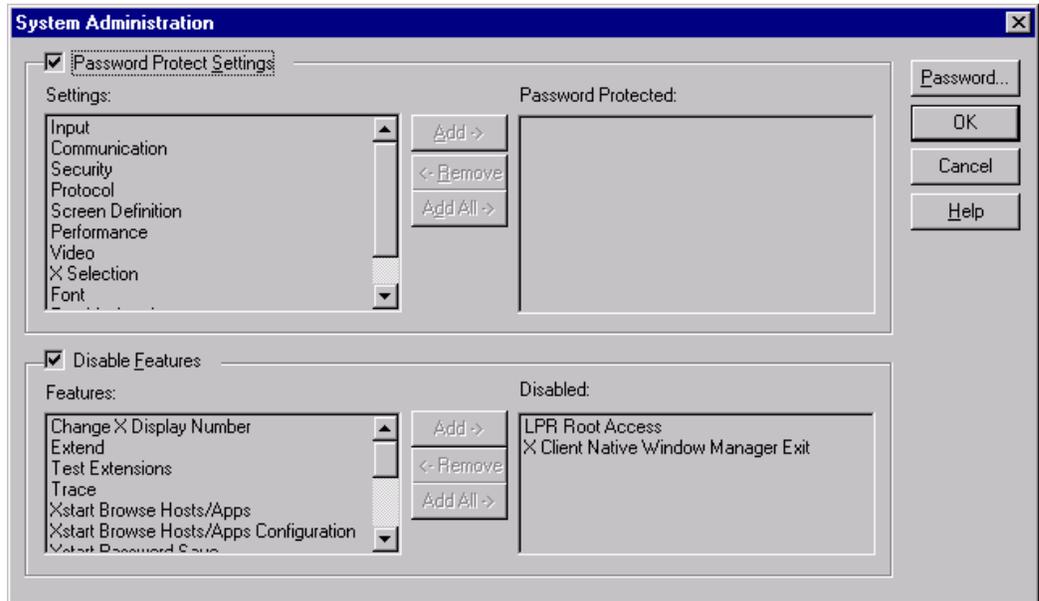


Figure 1 Exceed System Administration Settings for the MCC

*Note:* 'X Client Native Window Manager Exit' is in the Disabled box. This is NOT the default setting.

2. To avoid possible console timeout errors, launch **xconfig** from the Exceed program menu, then choose **Settings — Transports**. Set the options in the resulting window as follows:

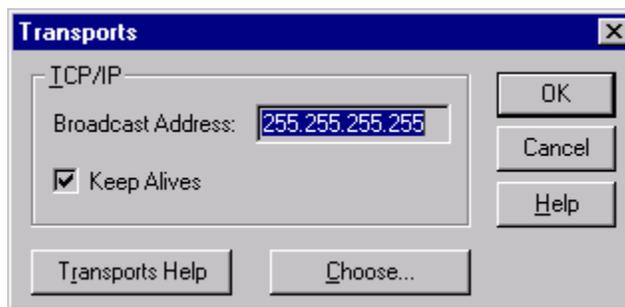


Figure 2 Exceed System Transport Settings for the MCC

*Note:* Ensure that **Keep Alive** is checked.

- In the win.ini file in the Windows installation directory (WinNT or Windows, not the Exceed directory), add the following if an Exceed section does not exist:

```
[exceed]
custom=1
```

If an Exceed section already exists, add 'custom=1' if necessary.

- If the MCC is started through the Exceed xstart application, launch the Exceed XStart application from the Start Menu, then click the Other button in the upper right corner. Ensure the resulting Other Settings window is as follows:

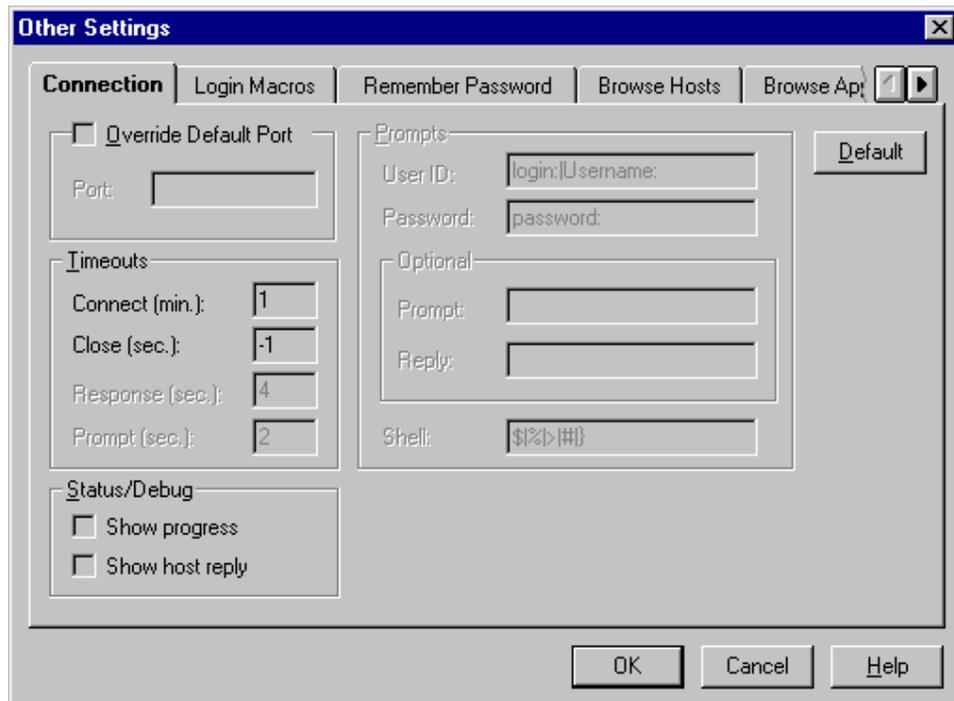


Figure 3 Exceed System Other Settings for the MCC

*Note:* In the section called **Timeouts**, the '**Close (sec):**' field must be set to -1.

### PS/2 Keyboard (101 Key IBM version, manufactured by Lexmark)

Esc	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11	F12	Print Screen SysRq	Scroll Lock	Pause Break					
~ `	1 !	2 @	3 #	4 \$	5 %	6 ^	7 &	8 *	9 (	0 )	- _	= +	Backspace	Insert	Home	Page Up	Num Lock	/	*	-
Tab	Q	W	E	R	T	Y	U	I	O	P	{ [	} ]	 \ _	Delete	End	Page Down	7 Home	8 Up	9 PgUp	+
Caps Lock	A	S	D	F	G	H	J	K	L	; :	" '	Enter				4 Left	5 5	6 Right		
Shift	Z	X	C	V	B	N	M	< ,	> .	? /	Shift			Up			1 End	2 Down	3 PgDn	Enter
Ctrl		Alt	Spacebar									Alt	Ctrl	Left	Down	Right	0 Ins	.	Del	

### Scan Codes

01	3B	3C	3D	3E	3F	40	41	42	43	44	57	58	XShift E0 37 Alt 54	46	E1 1D Ctrl E0 46					
29	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	E0 52	E0 47	E0 49	E0 45	E0 35	37	4A
0F	10	11	12	13	14	15	16	17	18	19	1A	1B	2B	E0 53	E0 4F	E0 50	47	48	49	4E
3A	1E	1F	20	21	22	23	24	25	26	27	28	1C					4B	4C	4D	
2A	2C	2D	2E	2F	30	31	32	33	34	35	36				E0 48		4F	50	51	E0 1C
1D		38	39								E0 38		E0 1D	E0 4B	E0 50	E0 4D	52	53		

Note: See  
Implementation  
Notes  
previously

Figure 4 PS/2 Keyboard

### 3270 North American Keyboard (122 Keys)

F13	F14	F15	F16	F17	F18	F19	F20	F21	F22	F23	F24
F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11	F12

Attn SysRq	Clear	~ 	1	@ 2	# 3	\$ 4	% 5	^ 6	& 7	* 8	( 9	) 0	- =	Backspace	Dup PA1	FldMk PA2 ChgSc	Jump PA3	Esc	NumLk ScrLk	,	Space	
CrSel	Pause Erinp	Tab	Q	W	E	R	T	Y	U	I	O	P	!	;	Return	BkTab	Insert	Delete DelWd	7	8	9	Tab +
ExSel	ErEOF	Caps Lock	A	S	D	F	G	H	J	K	L	:	"	}			Up	4	5	6	-	
SetUp	Record	Shift	>	Z	X	C	V	B	N	M	,	.	?	/	Shift	Left BOL	Rule Home	Right EOL	1	2	3	Enter
Print Ident	Copy Play Test	Reset Quit		Alt	Spacebar								Alt	Enter		Down			0	.		

#### Scan Codes

5B	5C	5D	63	64	65	66	67	68	69	6A	6B
3B	3C	3D	3E	3F	40	41	42	43	44	57	58

71	76	29	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	5A	E0 49	E0 51	01	Shift E0 45	37	E0 35	
72	45	0F	10	11	12	13	14	15	16	17	18	19	1A	1B	1C	E0 4F	E0 52	E0 53	47	48	49	4E	
74	6D	3A	1E	1F	20	21	22	23	24	25	26	27	28	2B			E0 48		4B	4C	4D	4A	
XShift E0 37	6F	2A	56	2C	2D	2E	2F	30	31	32	33	34	35	36		E0 4B	E0 47	E0 4D	4F	50	51	E0 1C	
75	6C	1D		38	39								E0 38		E0 50					52		53	

Figure 5 3270 North American Keyboard



# Chapter 4 MCC Configuration File Management

This chapter discusses:

- Directory structure.
- Syntax of the configuration files.
- MCC Configuration Files.

Most configuration files are processed only at the startup of the MCC.

**Caution:** If changes are made to any of the configuration files, the MCC software must be cycled (stopped and restarted). Any active users should log out before recycling the MCC, or they may see unpredictable or inaccurate data.

*Note:* After changing a configuration file in the MCC editor, save the file and run the configuration checker (cfgchk) program to check for errors. This program can be run from the **Administration** menu **Configuration—Check Configuration** option, or from the Unix command line (see *CFGCHK* on page 210 for details).

## Syntax of Configuration files

The syntax of the configuration files consists of comments, sections, keys, and values.

### Comments

When creating or editing the configuration files include plenty of comments. A comment statement begins with double slashes “//” or a pound sign “#”, and ends at the end of the line. Double slashes are the preferred method of adding comments.

A blank line is also considered a comment.

### Sections

Sections contain headers, keys, and values. A section begins with the section header, and ends with the section header of the next section or the end of the file. A section header contains a keyword and a unique name, enclosed in brackets. The name must be unique for all section occurrences of the keyword. For example:

```
[cpu 9021]
```

where

Left bracket “[” begins the definition of the section header.

CPU is a section header keyword.

9021 is the unique name (within all cpu sections) given to the section (spaces are allowed).

Right bracket “]” ends the definition of the section header.

*Notes:* The term “section name” refers to only the unique name in the section header.

Section names are case-insensitive.

## Keys

Keys are keywords or user-defined field names. They are on the left side of the equation. For example:

```
os=Prod2
```

where

OS is a keyword in a cpu section.

Equals “=” ends the key and begins the value.

Prod2 is the value of the key.

<i>Note:</i> Keys are case-insensitive.
---

## Values

Values are on the right side of the equation and, depending on the section, contain one or more value definitions. Some keys require a single value, such as a word or a number, and others require or allow multiple value definitions. For example:

```
desired=order:1, type:list, list:mvsstat
```

where

Desired is a key - a user-defined field name.

Equals “=” ends the key and begins the value.

The example above shows a multiple value definition. The order is #1, the type is a list, and the list values are defined by the mvsstat definition.

<i>Note:</i> Values are case-insensitive.
---

## MCC Configuration Files

Add or modify MCC configuration files from the Master window Administration menu **Configuration** option. Table 5 lists configuration files for the MCC:

File Name	Menu Option	Page
fonts.cfg	Fonts	44
keymap.cfg	Emulator:Keyboard Index	45
objmgr.cfg	Object Manager	47
osgrp.cfg	OS Groups	45
security.cfg	Security	45
snmp.cfg	SNMP Setup	45
status.cfg	Status Colors	53
system.cfg	System	46
charset.cfg	None (character sets)	58
vt100.kbrd, vt220.kbrd, hard3151.kbrd, as400.kbrd, ibm3274.kbrd, hp7009x.kbrd	None (soft keys)	58

*Table 5 List of MCC Configuration Files*

### fonts.cfg: Font Configuration

The fonts configuration file contains all font information necessary for the MCC programs. User modification of this file is generally unnecessary and not recommended. If a font problem occurs, contact Visara Technical Support for assistance before modifying this file.

## keymap.cfg: Keyboard Mappings

The keymap configuration file contains data necessary for the various hardware and OS consoles defined in the system.cfg file. Its purpose is to define the keymap file for X terminal vendors, since manufacturers can implement different keycode values for each key on the keyboard.

There are three valid formats for defining X terminals:

To add all Tektronix X terminals, add this line:

```
vendor:Tek=config/keymaps/tek
```

To add the MCC terminal at IP address 192.1.1.51, add:

```
display:192.1.1.51=config/keymaps/tek
```

To use the config/keymaps/default file for all X terminals not otherwise defined, use this line:

```
default=config/keymaps/default
```

The following line must be present for gwcharcons to function properly:

```
type:char_default=config/keymaps/gwcharcons
```

## osgroup.cfg: OS Groups

The OS Group configuration file contains all necessary information for MCC operating system groups. All modifications of this file must be made through the OS Group Editor. Direct editing of this file is not necessary. See *Chapter 6 Defining and Changing OS Groups* for more information.

## security.cfg: User Security

The security configuration file contains all necessary information for MCC security. All modifications of this file must be made through the Security Editor. Direct editing of this file is not necessary. See *Chapter 8 Administering Users* for more information on MCC Security.

## snmp.cfg: SNMP Agents

The SNMP Agent configuration file contains information on SNMP Agents and SNMP Agent groups. All modification of this file must be made through the SNMP Setup option of the Administration—Configuration menu. Direct editing of this file is not necessary. See *Chapter 7 Setting Up SNMP* for more information.

## system.cfg: MCC System

The system configuration file contains two major definitions:

- The layout of the System Summary window (the organization of the System Summary window icons).
- The host port definitions, including the physical connections to the host equipment (for example, mainframes, routers, and Unix servers).

*Note:* Some commands listed in the *Scripting Guide*, such as `ICON()`, are case-sensitive. An icon's definition in `system.cfg` must match its usage in the command. Any differences will generate a run-time error. Thus, if the CPU is defined as "RS6000", the icon command must use the same capitalization.

Refer to *Chapter 5 MCC system.cfg Configuration File* for detailed information about the `system.cfg` file.

## swlist=: Software (Task) Definition Lists

The filename specified by the `swlist=` key in the `system.cfg` file may be any name that the customer chooses. Each OS should have its own `swlist` file for ease of future maintenance.

Remembering that the default directory of the MCC is `/usr/ics`, it is necessary to specify the residing directory for the `swlist` files. The `swlist` files reside in the `/usr/ics/config/swlist` directory. Therefore, for a `swlist` file called `SYSA`, the following is the actual `swlist=` entry:

```
swlist=config/swlist/SYSA
```

If multiple `swlist` files are specified for an OS, the contents of the two files are merged and sorted on the software display.

The format of the `swlist` file is a list of tasknames and for each task, the initial value for any field. This initial value overrides the default value supplied by the optional "default:value" in `objmgr.cfg`

The taskname will appear in the task list as typed (case sensitive).

*Note:* The MCC accepts a maximum of 600 task entries in each `swlist` file.

### **Example:**

```
//use all defaults for this task
[sw RACF]
//override the two specified fields default values

[sw VTAM]
desired=UP
current=UP
```

```
[sw taskname]
fieldname1=5
fieldname2="CAT"
fieldname3=UP
```

The TaskName can be a maximum of 11 characters.

### **objmgr.cfg: Object Manager**

The object manager configuration file contains information to define objects to the MCC Object Manager. This includes Task Manager (TaskMan) options, colors, color rules, object types, object fields, and pick lists.

#### **Options Section**

The options section of the objmgr.cfg file defines options to the object manager system.

The TMGUI options section defines options for the TaskMan user-interface program.

The following table outlines the valid key requirements:

<b>Key</b>	<b>Min Qty</b>	<b>Max Qty</b>	<b>Description</b>
confirm_edit	1	1	On Edit Task window, confirm Save button selection.
confirm_desired	1	1	On OS Software window, confirm Set Desired Status button selection.

*Table 6 objmgr.cfg Options Section*

Example:

```
[options tmgui]
confirm_edit=true
confirm_desired=true
```

#### **Colors Section**

The colors section defines foreground and background color combinations for text display purposes. Each defined combination is used in the color rules sections.

Each combination is given a unique name and is on the left side of the equation. The right side of the equation contains the color definition for the name. The first color represents the color of the text (foreground). The second color represents the color of the “white space” in the cell (background).

The last number is the status number to propagate to the OS level for the color combination. The number corresponds to a status number in `status.cfg`, and therefore must be between '1' and '16'.

*Note:* A name of “normal” must always exist. The MCC uses its definition as the default (or “normal”) display color.

In the example below, the colors for the “normal” combination are white letters on a pale green background.

#### Example:

```
[colors]
normal=white/palegreen/9
warning=white/orange/5
error=white/red/1
inprocess=black/yellow/6
down=white/blue/12
```

### **ColorRules Section**

The `colorrules` section defines a set of color rules. Color rule sets are used by object types (refer to *Type Section* on page 49) for color display purposes based on values in fields. The list of rule sets is processed in the order listed; the first rule that matches is the only rule used.

The left side of the equation defines the fields and possible status combinations (the statuses are defined in *List Section* on page 49). It is a comma-delimited list in the format “fieldname:status”. Statuses must be explicitly defined; wildcards and asterisks “\*” are not permitted.

The right side of the equation defines the fields and the colors to set for the rule, for the combination of field values described on the left side of the equation. It is a comma-delimited list in the format “fieldname:colorname”. An asterisk “\*” for the fieldname means the color applies to all of the fields in the row. The asterisk rule is applied first (the entire row is set to that color), then any other fields listed are set to the listed color.

In the first example below (`mvscolors`), the first rule says “when the current field and the desired field are both set to the up status, display the entire row in the normal colors.” The second rule says “when the current field is set to the up status and the desired field is set to the down status, display the entire row in the normal colors, except for displaying the desired field in the warning colors”.

In the second example (`unixcolors`), the third rule says “when current field is down and desired field is up, mark the entire row with the error colors”. If the current field being unknown and the desired field is up, the fourth rule sets the colors to warning.

#### Examples:

```
[colorrules mvscolors]
```

```
current:up,desired:up      = *:normal
current:up,desired:down   = *:normal, desired:warning

[colorrules unixcolors]
current:up,desired:up     = *:normal
current:up,desired:down   = *:normal, desired:warning
current:down,desired:up   = *:error,
current:unknown,desired:up = *:normal, current:warning
```

### **List Section**

The list section defines a list of values (an enumerated list). A list in the definition of the list field type defines the valid entries for the list field.

The left side of the equation is the user-defined name for a valid option in the list definition. This text appears in pick lists, and sets the field status within scripts.

The right side of the equation is a unique integer assigned to each valid option.

#### **Example:**

```
[list current]
down=0
up=1
starting=2
stopping=3
unknown=4
```

### **Type Section**

The type section defines object types. Each object type has fields and colorrules.

#### **Example:**

```
[type mvs]
fields=mvsfields
colorrules=mvscolors

[type unix]
fields=unixfields
colorrules=unixcolors
```

## Fields Section

The fields section defines a set of fields. A set of fields is used for each object type. The field “taskname” is automatically created by the system and contains the name of the task. This field cannot be changed.

The left side of the equation is the field name. The field name may be up to 32 characters. The right side of the equation is a comma-separated list of attributes of the field definition in the format: “attribute:value”.

Table 7 outlines the valid attribute requirements:

Attribute	Legal Values	Description
order	0, 1, 2, ...	The order to display the fields on the TaskMan screen, left to right. When set to 0, the field is not displayed on the OS Software Summary window. However, it is displayed in the Field Edit window, according to the order in which it was defined.
wakeable	true, false	Relates to the OBJEXEC() command. Defines if waiting scripts wakeup if this field is changed.
type	list, string, int	The type of field.
list		For list field types, the name of valid list defined.
length		The maximum string length for string field types.
default		The default value for the field. This value can be overridden by specifying an initial value in the swlist file. If not specified or overridden, the default value is zero for integers, null for strings (“”), and the first list element for lists.
label		Optional. Specifies the text (label) displayed at the top of a field’s column in TaskMan. If not specified, the label defaults to the fieldname.
locked	true, false	Optional. If set to true, only scripts or administrators can change the status of this field. If unspecified or set to false, operators can also change the status of the field.

Table 7 objmgr.cfg Fields Section

**Notes:**

- A “desired” field must be defined for the Set Desired Status option to function correctly in the OS task list (TaskMan).
- The fields “tmmode” and “moveable” must be defined for the moving software between OS’s option to work in the OS task list (TaskMan). Refer to *Moving Tasks between Operating Systems* on page 52.
- Task Manager can track the program which last changed the “desired” field. This is useful for monitoring scripts in certain environments. To do this, create a field named “desiredsetby” as a string with length 6. Then, when the “desired” field is changed by a script or by the Task Manager GUI, “desiredsetby” is changed to “SCRIPT” or “TMGUI” respectively.

*Note:* If the length of the “desiredsetby” field is less than 6, only the specified number of characters is copied to the field.

**Example:**

```
[fields mvsfields]
current  =order:1, wakeable:true, type:list, list:current
desired  =order:2, wakeable:true, type:list, list:desired
desiredsetby =order:3, wakeable:false, type:string, length:6
```

```
[fields unixfields]
current  =order:1, wakeable:true, type:list, list:current
desired  =order:2, wakeable:true, type:list, list:desired
```

### ***Moving Tasks between Operating Systems***

TaskMan can move tasks from one OS to another. This feature is useful when a particular task may be handled by more than one OS, and the OS currently serving the task has failed in some way. Through careful setup and scripting, the task can be moved automatically to another OS using TaskMan. The relevant script(s) handle startup of the task on the new OS.

### **Configuring Movements of Tasks**

To allow moving of tasks, several configuration conditions must be met:

- All Operating Systems that tasks can move between must be defined as the same type (the “type=” value).
- The type definition must contain two list fields:
  - tmmode
  - moveable
- Required tmmode list values must be set:
  - None
  - Zombie
  - At least one other value
- Required moveable list values must be set:
  - No
  - Primary
  - Zombie

### **Moving Tasks**

To move a task, the task on the original OS must have:

- A tmmode status of neither None nor Zombie.
- A moveable status of either Primary or Zombie.

When the move option is chosen for a selected task, the user is presented with a list of Operating Systems of the same type as the original. Each of these operating systems has a tmmode status of Zombie and a moveable status of either Primary or Zombie. After the user selects the destination OS, TaskMan:

- Sets the destination OS tmmode status for the selected task to the same as the original OS tmmode status.
- Sets the destination OS desired status to the same as the original OS desired status.
- Sets the original OS tmmode to Zombie.

The task automatically starts on the destination OS when the site-specific TaskMan monitoring script detects a mismatch between the task’s desired status and current status fields.

For each moveable task, one OS should be marked with a moveable status of Primary; this is the OS where the task primarily resides. All other OSs should be marked with a moveable status of Zombie and a tmmode of Zombie; these are the OSs to which the task could be moved.

### **status.cfg: Status Colors**

The color definition file links a color to a status number. Each MCC object and message has a status that affects the object's color. The MCC allows the definition of 16 status colors. Each status color defines a background color and an optional foreground color. The status.cfg file allows users to define status colors that will override the default status colors.

See Table 8 for default status color values. These defaults apply to any status values that are not defined in the status.cfg file.

#### ***Changing the Status Colors***

The status.cfg file can override any of the default status colors. To override a default status color, add a line to the status.cfg file.

To change the background color for a status value the line format is:

```
status_number color_name
```

To change the foreground color of a status value, both the background and foreground colors must be specified, as follows:

```
status_number foreground_color_name/background_color_name
```

For example, to change the background of status **2** to **Black**, add the following line to the status.cfg file:

```
2 Black
```

To change the foreground of status **2** to **Red**, add this line:

```
2 Red/VioletRed
```

Choose a color name from the list of valid color names in Appendix A Valid Color Names.

If the status.cfg file is changed from the Administration menu, the cfgchk program must be run to check all the status color definitions in the file. Any errors found can be viewed in the Execution Log Window. Refer to *CFGCHK Program* on page 210 for detailed information.

Comments can be added to the status.cfg file by placing a # in the first column of the line. All text following the # is skipped.

*Note:* The Alert Window uses the foreground and background colors for a status value. The other MCC programs that use status.cfg color definitions only implement the background color.

Table 8 lists default status colors:

Status	Foreground Color	Background Color
1	White	Red
2	White	VioletRed
3	Black	HotPink
4	Black	Orange
5	Black	Yellow
6	Black	Gold
7	Black	White
8	Black	LightSkyBlue
9	Black	PaleGreen
10	Black	Aquamarine
11	Black	Cyan
12	Black	Gray
13	Black	LightSteelBlue
14	White	SteelBlue
15	White	Blue
16	White	Brown

*Table 8 status.cfg file Default Color Options*

The Status.cfg file shipped with the MCC therefore contains these entries:

```

1 Red
2 VioletRed
3 HotPink
4 Orange
5 Yellow
6 Gold
7 White
8 LightSkyBlue
9 PaleGreen
10 Aquamarine
11 Cyan
12 Gray
13 LightSteelBlue
14 SteelBlue
15 Blue
16 Brown

```

### **GCL Status Constants**

There are five status numbers represented as manifest constants in GCL, which should not be changed. They are listed in Table 9:

<b>Status</b>	<b>Color</b>	<b>Manifest Constant</b>
1	Red	STATUS_ERROR
4	Orange	STATUS_WARNING
6	Gold	STATUS_INPROCESS
9	PaleGreen	STATUS_NORMAL
14	SteelBlue	STATUS_DOWN

*Table 9 GCL Status Constants Colors*

If these colors are modified, take care to pick colors that are meaningful for the status. These statuses are reserved for displaying MCC information.

For example, when the MCC displays an error, it uses the color defined for STATUS\_ERROR, or 1. If the status.cfg file reads:

```
1 aquamarine
```

All errors are displayed in aquamarine, which may not be an intuitive error color for other users.

For a complete list of valid color names, refer to Appendix A Valid Color Names .

### **gclrund.txt: Defining Maximum Number of Concurrent Scripts**

The gclrund.txt file defines the maximum number of scripts that can execute at the same time on the MCC. The file contains one line, with a number between 2 and 256.

If the file does not exist or contains an invalid number, the default value of 35 is used.

If more than the defined number of scripts are executed, additional requests are queued (up to a maximum of 4096).

*Note:* Reserved scripts are not subject to this limit, but are executed immediately. A reserved script is any script whose name is preceded by a # symbol.

## **icsmaster.txt and masterwnd.txt: Configuring Shutdown**

ICSMaster is the master MCC program that starts and stops all MCC daemon programs. Masterwnd is the program associated with the master GUI window that is used to view active users, log in/out, and administer the MCC.

- When the MCC is shut down, ICSMASTER checks that all MCC programs terminate normally.
- At a normal MCC shutdown, the file `$ICSHOME/config/icsmaster.txt` contains regular expressions which are searched for in the active process list, and are stopped. Searching stops when ICSMASTER stops.
- At a normal MCC shutdown, the file `$ICSHOME/config/masterwnd.txt` contains regular expressions which are searched for in the active process list when masterwnd is exiting. Searching stops when masterwnd stops.

If any process is found in the regular expression matching, all of its child processes are also stopped. For instance, if `gclrund` is stopped, all of its child script processes are also stopped, including those which may be Unix shell scripts started as `SYSEXEC` commands. The only process left running by default (if it exists) is the screen editor. This way, unsaved files are not discarded inadvertently.

**Caution:** The `icsmaster.txt` and `masterwnd.txt` files should only be modified by Visara personnel.

For information on using ICSMASTER as a command line utility, refer to *ICSMaster* on page 208.

## User Defined Message File

Each message in a Log Display window can be linked by a keyword to a User Defined Message (UDM). UDMs are defined in the UDM file, and each consists of a keyword and up to 250 message lines. To open the User Defined Messages file for viewing or modification, use the Master Window's Administration—Configuration-User Messages menu option.

When a message in a Log display window is double-clicked, the UDM file keywords are processed against the message. For the first UDM entry with its keyword matching a string in the double-clicked message, its message is displayed in a pop-up window. If no UDM keyword match is found, the message “No User-Defined-Message is defined” is displayed in a pop-up window.

An entry in the UDM file is either a keyword or a message line. The following is the format of a UDM entry:

### Keyword

Field	1	2
Columns	1	2-9
Contains	0	Keyword text

**Field 1.** Each keyword line is represented by the number 0.

**Field 2.** Eight character keyword. This is the text for matching a message in a log display window. It can be message ids or general text.

### Message

Field	1	2
Columns	1	2-133
Contains	1	Message text

**Field 1.** Each message line is represented by the number 1.

**Field 2.** 132 character message line. A maximum of 250 message lines are permitted per UDM.

### Example

The following example uses “IOS000I” as its keyword:

```

Keyword — OIOS000I // IO error--better contact engineer.
Message Lines — 110 Error occurred!
                  1Please contact field engineer
                  1at 612-555-1234
  
```

## charset.cfg Character Set File

The charset.cfg configuration file contains data necessary for emulation of a keyset and display set in sessions with the host systems attached to the EBUS. The associated host systems are defined in the system.cfg file. Direct editing of these data files is not possible, but it is possible to verify their contents.

The values for keyset and dispset correspond to files of the same name as the value in /usr/ics/ebus. For example, if keyset=key3278, EBUS looks in file /usr/ics/ebus/key3278, and emulates the 3278 keyset.

Table 10 outlines the valid key requirements:

<b>Key</b>	<b>Required?</b>	<b>Quantity</b>	<b>Description</b>
keyset	No	0 or 1	Specifies key set for a session.
dispset	No	0 or 1	Specifies display for a session.

*Table 10 charset.cfg File Entries*

## Softkey Files

Softkeys can be defined to allow the user to send keys that are not obvious or present on the MCC keyboard. Examples include the “Start” and “Stop” keys on mainframe consoles, or the “Break” key on RS232/VT100 consoles. Refer to *Chapter 3 Selecting Consoles* in the Operations Guide for information on selecting and sending softkeys.

Default softkey files are provided for most console types, as listed in Table 11. Example softkey file formats are shown on page 60.

The default softkey files can be changed to match non-standard applications, providing the required softkeys are supported by the MCC software.

**Caution:** If the default softkey files are changed, test all relevant applications to ensure they function correctly with the revised softkeys.

If more than one set of softkey files is maintained on the MCC, ensure each set is named uniquely and an entry in the system.cfg file points to the files to use, for example:

```
softkeyfile=config/softkeys/vt100.kbrd
```

### Default Telnet Softkey Files

lotype= Value	Default Softkey File
vt100	vt100.kbrd
vt220	vt220.kbrd
as400perle	as400.kbrd
HP700/92	hp7009x.kbrd

*Table 11 Console Section, Default Softkey Files for Telnet*

Refer to *Telnet Console Type* on page 92 for more information on Telnet Iotype entries.

## Softkeys Mnemonics List

*Table 12 Key Mnemonics Supported by MCC Software* lists all keys that are supported by the MCC software and the keyboard emulations that support each key. Not all the keys listed are included in the default files provided; refer to *Adding a New Key* on page 67 to enable a key that is listed, but not included in the default files.

*Note:* When "3270" is shown in the table, the key is supported in all emulations of the 327x protocol family.

Key Mnemonic (for Action key)	Description	Emulations/Systems supporting this key	Notes
Alt_Clear	Alt + Clear	3270	
Alt_CrSel	Alt + Cursor Select	3270	
Alt_Insert	Alt + Insert	3080, 3090, 3270, 4381	
AssignCons	Assign Console	3090 and 3151	
BackSlash	\	All	
BackTab	Backwards tab	All but VT100 and VT220	
Break	Sends Break signal to host	VT100, VT220, AS/400, HP7009x	
Bkwd	Backward	3080, 3090, 3270 converged, and 3151	
BrokenPipe	;	All	May come out as a solid pipe on a VT100, VT220, or an AS/400
Cancel	Cancel	3090, 4381, and AS/400	
Caret	^	VT100, VT220, and 3151	Also known as circumflex
CentSign	¢	All mainframe emulations but not AS/400, 3151, VT100, or VT220	
ChgDply	Change Display	3080, 3090, 3270, 4381	
Clear	Clear	3080, 3090, 3270, AS/400, and 3151	

<b>Key Mnemonic (for Action key)</b>	<b>Description</b>	<b>Emulations/Systems supporting this key</b>	<b>Notes</b>
ClearDsp		HP7009x	
ClearLine		HP7009x	
CloseBrace	}	All	
CloseBracket	]	3151, VT100, and VT220	
Cmd		3080, AS/400	
Comma	,	All	
CommReq		3270 converged	
Copy		3270 converged, 4381	
CrSel	Cursor Select	3270	
DeleteChar		HP7009x	
DeleteLine		HP7009x	
DeleteWrap		HP7009x	
DelWord	Delete Word	3270 converged	
Delete	Delete	All	
Diag		3270 converged	
DMsgBkwd		3080	
DMsgFrwd		3080	
DownArrow	Cursor down arrow	All	
Dup	Duplicate	3270 and AS/400	
DvCnl	Device Cancel	3090, 3270, and AS/400	
End		3090 and 3151	
Enter		All	Transmits information to the mainframe; functionally equivalent to Return on VT100 and VT220
ErEOF	Erase to end of field	3080, 3090, 3270, 4381, and 3151	
ErInp	Erase input	All but VT100 and VT220	
ExSel	Extend selection	3270 converged	

<b>Key Mnemonic (for Action key)</b>	<b>Description</b>	<b>Emulations/Systems supporting this key</b>	<b>Notes</b>
Exclaim	!	All	
F1 through F12	Same as PF1 through PF12	All	HP7009x does not support F9 through F12.
F13 through F24	Same as PF13 through PF24	3270, AS/400, VT100, VT220	
Find		VT220	
FldMark	Field mark	3270	
FldMinus		AS/400	
Frwd	Forward	3080, 3090, 3270 converged, 3151	
HardReset		HP7009x	
Hex		AS/400	
Home		3080, 3090, 3270, 4381, and AS/400	
HomeDown		HP7009x	
HomeUp		HP7009x	
Ident		3080, 3090, 3270, 4381	
Index		3090, 3151	
InitTerm	Initialize terminal	AS/400	
Insert		VT220, 3080, 3090, 3270, 4381, AS/400, and 3151	
InsertChar		HP7009x	
InsertLine		HP7009x	
InsertWrap		HP7009x	
Intr		4381	
Irpt		3080, 3090, 3270 base keyboard, and 3151	
Istep		3090 and 3151	
Jump		3270 converged	
KP_0	VT100 and VT220 numeric keypad 0	VT100 and VT220	
KP_1	VT100 and VT220	VT100 and VT220	

<b>Key Mnemonic (for Action key)</b>	<b>Description</b>	<b>Emulations/Systems supporting this key</b>	<b>Notes</b>
	numeric keypad 1		
KP_2	VT100 and VT220 numeric keypad 2	VT100 and VT220	
KP_3	VT100 and VT220 numeric keypad 3	VT100 and VT220	
KP_4	VT100 and VT220 numeric keypad 4	VT100 and VT220	
KP_5	VT100 and VT220 numeric keypad 5	VT100 and VT220	
KP_6	VT100 and VT220 numeric keypad 6	VT100 and VT220	
KP_7	VT100 and VT220 numeric keypad 7	VT100 and VT220	
KP_8	VT100 and VT220 numeric keypad 8	VT100 and VT220	
KP_9	VT100 and VT220 numeric keypad 9	VT100 and VT220	
KP_Add	VT100 and VT220 numeric keypad +	VT100 and VT220	
KP_Decimal	VT100 and VT220 numeric keypad .	VT100 and VT220	
KP_Divide	VT100 and VT220 numeric keypad /	VT100 and VT220	
KP_Enter	VT100 and VT220 numeric keypad enter	VT100 and VT220	
KP_F1	VT100 and VT220 keypad F1	VT100 and VT220	
KP_F2	VT100 and VT220 keypad F2	VT100 and VT220	
KP_F3	VT100 and VT220 keypad F3	VT100 and VT220	
KP_F4	VT100 and VT220 keypad F4	VT100 and VT220	
KP_Multiply	VT100 and VT220 numeric keypad *	VT100 and VT220	
KP_Subtract	VT100 and VT220 numeric keypad -	VT100 and VT220	

<b>Key Mnemonic (for Action key)</b>	<b>Description</b>	<b>Emulations/Systems supporting this key</b>	<b>Notes</b>
LastCmd	Last command	3090 and 3151	
Left		3090 and 3151	
LeftArrow	Move cursor left	All	
LeftDbl	Move cursor left two positions	3080, 3090, 3270, 4381, AS/400	
LineDisc		4381	
Menu		HP7009x	
ModeSel		4381	
Msg		3080	
Newline		AS/400	
Next Screen		VT220	
NextSess	Move to next session	AS/400	
NotSign	¬	3080, 3090, 3270, 4381	
OpenBrace	{	All	
OpenBracket	[	VT100, VT220, 3151, AS/400, HP7009x	
PA1	Program Attention 1	3090, 3270, 3151	
PA2	Program Attention 2	3270, 3151	
PA3	Program Attention 3	3270 converged	
PageUp		4381, AS/400, HP7009x	
PageDown		4381, AS/400, HP7009x	
Pause		3270 converged	
Play		3270 converged	
Prev Screen		VT220	
Print		3080, 3090, 3270, 4381, AS/400, HP7009x	
Record		3270 converged	
Refresh		3080, 3090, AS/400, 3151	
Remove		VT220	
ReqDisc	Request disconnect	AS/400	
Request		4381	

<b>Key Mnemonic (for Action key)</b>	<b>Description</b>	<b>Emulations/Systems supporting this key</b>	<b>Notes</b>
Reset		3080, 3090, 3270, 4381, AS/400, 3151	
Restart		3080, 3090, 3151, HP7009x	
Return		All	Mainframe – moves to first keyable field on next line. VT100 – functionally equivalent to Enter
Right		3090, 3151	
RightArrow	Move cursor right	All	
RightDbl	Move cursor right two positions	3080, 3090, 3270, 4381, AS/400	
ScrollDown		HP7009x	
ScrollUp		HP7009x	
Select		HP7009x, VT220	
Session1	Switch to session 1	AS/400	
Session2	Switch to session 2	AS/400	
Session3	Switch to session 3	AS/400	
Session4	Switch to session 4	AS/400	
Session5	Switch to session 5	AS/400	
Session6	Switch to session 6	AS/400	
Session7	Switch to session 7	AS/400	
Setup		3270 converged, AS/400	
Shift F6 through Shift F20		VT220	
SoftReset		HP7009x	
SolidPipe		All but 3151	
Space		All	
SpMO		4381	
Start		3080, 3090, 4381, 3151	
Status	Session status from	AS/400	

Key Mnemonic (for Action key)	Description	Emulations/Systems supporting this key	Notes
	Perle box		
Stop		3080, 3090, 4381, 3151, HP7009x	
SvPCE		3090	
SwapCons	Swap Console	3090, 3151	
SysReq	System Request	3270, AS/400	
System		HP7009x	
Tab		All	
Test		3080, 3090, 3270, 4381, AS/400	
TOD	Time of day	3080, 3090, 3151	
Toggle	Toggle status indicators	AS/400	
User		HP7009x	
UpArrow	Move cursor up	All	
ViewLog	View log file	3090, 3151	

*Table 12 Key Mnemonics Supported by MCC Software*

## Changing the Default Softkeys

### ***Changing the Functionality of an Existing Key***

To change the functionality of the softkeys (for example, its label or the character sequence sent when selected), edit the relevant section(s) of the files described in *Example Softkey Files* on page 67. For example, to change the label on the “Enter” key of the VT100 softkeys, edit the following entry in the VT100 keypad.bank:

```
[key]
location=3,4
size=1,2
label=Enter
action=KP_Enter
```

If the label should read “Send”, the revised entry should appear as follows:

```
[key]
location=3,4
size=1,2
label=Send
```

```
action=KP_Enter
```

However, because the action= is unchanged, KP\_Enter is still sent to the host.

### **Adding a New Key**

To add one of the keys listed in *Table 12 Key Mnemonics Supported by MCC Software* to the available softkeys, edit the relevant .bank file to include the required key mnemonic and the label for the key. For example, to add a caret (circumflex) key to the VT100 keypad softkeys, make the following entry in the keypad.bank file:

```
[key]
location=2,6
label=^
action=Caret
```

The key location selected must be unique, and is typically the next unused location.

### **Example Softkey Files**

For each softkey “keyboard” layout, several softkey files are necessary, including a main definition file and one or more files defining available keys.

Each [key] section in a .bank file defines the label or symbol on a key in the Soft Keys window, and the corresponding action that is sent when the key is selected in keypad or non-keypad mode.

#### **Example of Main (.kbrd) Softkey File**

An example of a main softkey file is shown below, in this case the default file for VT100 called vt100.kbrd.

Note that this file points to three .bank files that define the operation of the function keys, arrow keys, and numeric keypad respectively.

```
[bank function]
keys=config/softkeys/vt100_function.bank
top=form
left=form
right=form

[bank arrows]
keys=config/softkeys/vt100_arrows.bank
top=function
left=form
#right=form
bottom=form

[bank keypad]
keys=config/softkeys/vt100_keypad.bank
```

```
top=function  
left=arrows  
right=form  
bottom=form
```

**Example of function.bank Softkey File**

An example of the VT100 function.bank file is shown below:

```
[sizes]
width=60
height=40

# Row 0 -- F1-F12.
[key]
location=0,0
label=F1
action=F1

[key]
label=F2
action=F2

[key]
label=F3
action=F3

[key]
label=F4
action=F4

[key]
label=F5
action=F5

[key]
label=F6
action=F6

[key]
label=F7
action=F7

[key]
label=F8
action=F8

[key]
label=F9
action=F9
```

[key]  
label=F10  
action=F10

[key]  
label=F11  
action=F11

[key]  
label=F12  
action=F12

# Row 2 - F13-F24

[key]  
location=0,1  
label=F13  
action=F13

[key]  
label=F14  
action=F14

[key]  
label=F15  
action=F15

[key]  
label=F16  
action=F16

[key]  
label=F17  
action=F17

[key]  
label=F18  
action=F18

[key]  
label=F19  
action=F19

```
[key]
label=F20
action=F20
```

```
[key]
label=F21
action=F21
```

```
[key]
label=F22
action=F22
```

```
[key]
label=F23
action=F23
```

```
[key]
label=F24
action=F24
```

**Example of arrows.bank Softkey File**

An example of the VT100 arrows.bank file is shown below:

```
[sizes]
width=60
height=40

# NOTE: Strings in this file were converted to actions so the #
softkeys would work correctly in both keypad and non-keypad # modes.
# Row 0 -- up
[key]
location=1,0
symbol=uparrow
#string=\e[A
action=UpArrow

# Row 1 -- left home right

[key]
location=0,1
symbol=leftarrow
#string=\e[D
action=LeftArrow

[key]
label=Home
#string=\e[H
action=Home

[key]
symbol=rightarrow
#string=\e[C
action=RightArrow

# Row 2 -- down

[key]
location=1,2
symbol=downarrow
#string=\e[B
action=DownArrow
```

**Example of keypad.bank Softkey File**

An example of the VT100 keypad.bank file is shown below:

```
# VT100 numeric keypad definitions
[sizes]
width=80
height=40

[key]
location=0,0
label=KP F1
action=KP_F1

[key]
location=1,0
label=KP F2
action=KP_F2

[key]
location=2,0
label=KP F3
action=KP_F3

[key]
location=3,0
label=KP F4
action=KP_F4

# Break key
[key]
location=0,1
label=Break
action=Break

# Resetkey - Reset Telnet Connection
[key]
location=1,1
label=Reset
action=Reset

[key]
location=2,1
label=*
action=KP_Multiply
```

[key]  
location=3,1  
label=/  
action=KP\_Divide

[key]  
location=0,2  
label=7  
action=KP\_7

[key]  
location=1,2  
label=8  
action=KP\_8

[key]  
location=2,2  
label=9  
action=KP\_9

[key]  
location=3,2  
label=+  
action=KP\_Add

[key]  
location=0,3  
label=4  
action=KP\_4

[key]  
location=1,3  
label=5  
action=KP\_5

[key]  
location=2,3  
label=6  
action=KP\_6

[key]  
location=3,3  
label=-  
action=KP\_Subtract

```
[key]
location=0,4
label=1
action=KP_1
```

```
[key]
location=1,4
label=2
action=KP_2
```

```
[key]
location=2,4
label=3
action=KP_3
```

```
# This should be double-height
```

```
[key]
location=3,4
size=1,2
label=Enter
action=KP_Enter
```

```
[key]
location=0,5
size=2,1
label=0
action=KP_0
```

```
[key]
location=2,5
label=.
action=KP_Decimal
```

The Reset – Reset Telnet Connection section provides a reset button that may be used in the unlikely event that a telnet server hangs. If the user selects the reset button, the hung telnet session is terminated and a new connection opened.



## Chapter 5 MCC system.cfg Configuration File

This chapter defines the layout of the MCC system configuration file, which includes the following sections:

- Room section
- Group section
- CPU section
- OS section
- Console section
- Printer section
- Unit section
- MVS Agent

This file must be customized for each MCC installation.

**Caution:** If changes are made to any of the configuration files, the MCC software must be cycled (stopped and restarted). Any active users should log out before recycling the MCC, or they may see unpredictable or inaccurate data.

*Note:* After changing a configuration file in the MCC editor, save the file and run the configuration checker (cfgchk) program to check for errors. This program can be run from the **Administration** menu **Configuration—Check Configuration** option, or from the Unix command line (see *CFGCHK* on page 210 for details).

## Section Name Length

Table 13 lists the sections of the system configuration file, and the maximum length (number of characters) permitted in the section name.

<b>Section</b>	<b>Maximum Length</b>
Room (header)	8
Room Comment	31
Group (header)	8
CPU Name	8
OS Name	11
Hostname	11
Console	30
Unit	8
Printer	30
MVS	64

*Table 13 Section Name Length Limits*

## Valid Key Requirements

Each section includes a list of keys that may be required in the system.cfg section. Some keys that are listed are optional.

The **Required?** column defines whether this key must be included in this section or if the key is optional:

- **Yes** Section must include this key.
- **No** This key is optional.

The **Qty** column defines the minimum number of keys to include in this section:

- 1** Section must have at least one key.
- 0** Key is optional and may be omitted.
- ~** May include as many keys as necessary.

## Room Section

The room section defines the top level of the System Summary window. The room section name determines the name of the room icon. The room name must be eight characters or less.

The CPU icons and the group icons are displayed left to right in the order in which they are defined in the file.

CPUs defined within groups should not also be defined in the Room section. See *CPU Section* on page 82 for more details.

## Valid Keys

Table 14 outlines valid key requirements for the room section:

Key	Required?	Quantity	Description
comment	Yes	1	Comment line appearing at the bottom of the room icon. Must be thirty-one characters or less.
cpu	No	0 through ~	CPU definition to display at the top level.
group	No	0 through ~	Group definition to display at the top level.
startup_status	No	0 or 1	The initial color for the room icon. See <i>status.cfg: Status Colors</i> on page 53 for more information. Defaults to 9.

Table 14 Valid Keys for Room section

## Example

```
[room Mpls]
comment=Acme Center
cpu=9021
cpu=9672
cpu=SUN-2000
startup_status=9
```

## Group Section

The group section defines a group of CPUs and other groups. This allows creation of subgroups, creating a hierarchy. The group section name determines the name of the group icon. The group name must be eight characters or less.

*Note:* CPUs defined within groups should not also be defined in the room section. See *CPU Section* on page 82 for more details.

## Valid Keys

Table 15 outlines the valid key requirements for the group section:

Key	Required?	Quantity	Description
cpu	No	0 though ~	CPU definition to display in the group
group	No	0 though ~	Group (subgroup) definition to display in the group
startup_status	No	0 or 1	The initial color for the group icon. Defaults to 'g'.

*Table 15 Valid Keys for Group Section*

## Example

```
[group Unix]
group=SunBoxes
group=AIXBoxes
cpu=HP-9000
```

```
[group AIXBoxes]
cpu=PS-340
cpu=M43
cpu=PS-320H
...
```

```
[group WebSrv]
cpu=Sparc-1k
cpu=AXPPCI33
cpu=RT_PC
```

## CPU Section

The CPU section defines a CPU, its console, and its operating systems. The CPU section name determines the name of the CPU icon. The CPU name must be unique and eight characters or less. If a CPU name appears in a group, it cannot be used in the room. For example, having the CPU HP9000 in both a group and a room is invalid. The system.cfg file can contain a maximum of 600 CPU sections.

### Valid Keys

Table 16 lists the valid key requirements for the CPU section:

Key	Required?	Quantity	Description
os	Yes	1 through unlimited	OS definition to include in the CPU.
console	No	0 or 1	The system console for the CPU.
channels	No	0 or 1	The number of channels defined in the CPU (for mainframes).
power	No	0 or 1	The power device name for powering on the system.
unit	No	0 or 1	Unit definition to include in the CPU.
startup_status	No	0 or 1	The initial color for the CPU icon. Defaults to '9'.

*Table 16 Valid Keys for CPU Section*

### Example

```
[cpu 9021]
console=9021 SYSTEM
channels=255
os=PROD
os=BETA
os=TEST
```

```
[cpu PS-320H]
console=320H-RS232
os=AIX325-320H
startup_status=6
```

```
[cpu M43]  
console=M43-RS232  
os=AIX325-M43
```

```
[cpu PS-340]  
console=PS340-telnet  
os=AIX411-340
```

## OS Section

The OS section of the MCC system.cfg file defines an OS, its type, its consoles, and software lists. The OS section name determines the name of the OS icon.

VM and server systems such as Unix machines do not require a printer defined, as neither has the concept of a printer console as does MVS. However, a printer must be defined if the MCC system is using the “Q” series of commands in scripts (refer to the QREAD command in the *Scripting Guide* for more details).

The OS Name must be 11 characters or less, and the system.cfg file can contain a maximum total of 600 OS sections.

## Valid Keys

Table 17 lists valid key requirements for the OS section:

Key	Required?	Quantity	Description
console	No	0 or 1	The console definition to use as the OS console. This is the name of a console section.
printer	No	0 or 1	The printer definition to use as the printer console. For mainframes, it is the name of a printer section. For non-mainframes, specify the name of a console section to use as a printer console.
type	No	0 or 1	The user-defined class for the OS — the object manager type. Determines the fields used in the Object Manager definitions. Refer to <i>objmgr.cfg: Object Manager</i> on page 47.
swlist	No	0 through unlimited	The file that contains software/task definitions for the OS.
startup_status	No	0 or 1	The initial color for the OS icon. Defaults to ‘9’.

hostname	No	0 or 1	Network host name for the system. Typically, this will be the same as the OS name, but the true network host name may differ due to character limitations. If you use the MCC/BMC PATROL integration product, the host name must refer to the name of the host as reported by BMC PATROL agents. The MCC OS name refers to the name of an OS inside the MCC.
mvsagent	No	0 or 1	Associates an MVSAGENT configuration with the OS. The MVS Agent is a command path to the mainframe, and can also be used as a higher bandwidth printer output transport. This alternative communication requires VISARA's product on the MVS LPAR.  It must not be present in the OS section for MCCStars.

*Table 17 Valid Keys for OS Section*

## Example

```
[os PROD]
type=mvs
console=PROD OS
printer=PROD PRN
swlist=config/swlist/prod

[os AIX325-320H]
type=unix
console=320H-RS232
printer=320H-RS232
swlist=config/swlist/AIX325-320H

[os AIX325-M43]
type=unix
console=M43-RS232
swlist=config/swlist/AIX325-M43

[os op2]
type=unix
hostname=op2
console=Test Console
swlist=config/swlist/test0

[os SHORT]
type=unix
hostname=really_long_hostname
console=Test Console
swlist=config/swlist/test0

[OS OP1]
type=unix
hostname=op1
console=Test Console
swlist=config/swlist/test0

[os KANSAS CITY]
type=unix
hostname=kansas_city
console=Test Console
swlist=config/swlist/test0
```

```
[os QuuxOS]
type=mvs
console=Quux OS
printer=Quux PRN
mvsagent=QuuxAgent
```

## Console Category Section

It is possible to assign console categories to each console on the Console Selection window. Each console can have no categories or several categories assigned to it.

Category names listed in the console category section are case-sensitive, and display in exactly the format typed in the Console Selection window.

Category names listed in the console section are case-insensitive. For example, if you list 'Florida' in the console category section and 'florida' in the console section (categories=florida), 'Florida' appears in the Console Selection window.

Any category names specified in console sections but not defined in the category console section are ignored.

### Example

```
[category console]
Minnesota
Florida
California
MVS
UNIX
```

## Console Section

The console section defines an OS console connection. The console section name determines the name of the console emulator icon. Console names can be a maximum of 30 characters. Consoles types may be:

- Telnet
- TN3270
- TN5250
- ICON
- Command

*Notes:* When adding consoles or changing console names, be sure to update the security group profiles. By default, all groups have access rights of 'none' for a new console—no one can see or use the console until the access rights to each group are changed.

Console names must not contain a forward slash (/) character.

The Console Manager checks for mismatched specifications when a console and printer are defined on the same port, for example, if baud rates, number of bits, parity, or handshaking differ. Any errors detected are sent to the Execution Log.

If an attempt is made to boot a card for which no consoles or printers are defined, the firmware download attempt terminates, but there is no adverse effect on MCC operation. The message "IFM137M Card <card name> has no consoles or printers specified for it" also appears in the Execution Log.

## Common Console Section Keys

Table 18 lists the keys common to all console definitions:

Key	Required?	Quantity	Description
interface	Yes	1	The type of interface. Valid entries are ICON, Command, Telnet.
lock_timeout	No	0 or 1	The number of seconds to wait before unlocking the terminal and discarding user typed text. If set to 0, the terminal will never automatically unlock. If not specified, the default is 30 seconds.
audit	No	0 or 1	If “yes”, auditing is enabled for the console and console messages are copied to the Audit Log file. Only valid for ICON and telnet consoles.
softkeyfile	No	0 or 1	The file in which softkey definitions are found for this console. If not specified, the default softkey file is as listed in Softkey Files on page 59. For example, <code>softkeyfile=config/softkeys/hard3151.kbrd</code>
categories	No	0 or 1	Assigns the console to one or more categories. User-defined categories are listed in the Category Console Section. Category names are not case sensitive, and appear in the Console Selection window. If not specified, the console will only appear in the <b>ALL</b> category.
no_printer	No	0 or 1	If specified, no printer is defined for the console. Valid for Telnet consoles.
days_history	No	0 or 1	Defines the number of days that the console history log is retained for this console before being purged (see <i>Console History Log</i> on page 172). If “0” or omitted, no console history log is kept. Valid for ICON and Telnet consoles.

Table 18 Console Section, Common Keys

### **no\_printer Key Values**

The `no_printer` flag can be set to save resources. By default, a “printer console queue” of the incoming screen data is automatically created to facilitate the use of the Q series of script commands. If an OS section does not have a “`printer=`” statement in this section, use this flag to prevent creation of a printer queue for that section. QREAD and other Q series script commands will then not work on the affected OS.

## **ICON Section**

The ICON section of the system.cfg file defines an ICON interface unit, its type, and IP address. The ICON section name determines the name of the ICON console icon button. The ICON header name must be 11 characters or less. The name after the ICON tag must be unique.

Key	Required?	Quantity	Description
type	Yes	1	The type of ICON Interface Unit. Valid values are 1T for a single connection unit or one of 4T, 8T, 12T, 16T, 20T, XT for a multiple connection unit.  The various sizes are used to provide configuration checking assistance. You may always just use XT in this field.
ipaddr	Yes	1	IP address of the ICON Interface Unit.

*Table 19 Console Section, Icon Section*

### **Example:**

[ICON Unit1]

type=1T

ipaddr=192.83.120.207

[ICON Unit2]

type=XT

ipaddr=10.192.32.88

**ICON Console Type**

Table 37 outlines the valid key requirements for the ICON console type, in addition to those keys listed in Common Console Section Keys, Table 18 Console Section, Common Keys, Page 89:

Key	Required?	Quantity	Description
iotype	Yes	1	Matches an ICON name tag in the ICON section. You may always just use XT in this field.
Host	Yes	1	Host name that the iCON has been configured to use.

*Table 20 Console Section, Icon Console Type*

**Examples:**

AS/400 Session

```
[console ICON AS400 Session]
```

```
interface=Icon
```

```
icon=Unit1
```

```
host=Lpar1
```

```
audit=yes
```

**Example AS/400 printer**

```
[printer ICON My Printer]
```

```
interface=Icon
```

```
icon=Printer
```

```
host=Lpar1
```

```
days_history=7
```

## Telnet Console Type

The telnet section defines a telnet console session. The telnet section name determines the name of the console emulator icon.

### Valid Keys

Table 21 lists the valid key requirements, in addition to those keys listed in *Common Console Section Keys* on page 89:

Key	Required?	Quantity	Description
ioctype	Yes	1	The interface type—VT100, VT220, as400perle, or hp700/92, 3270, 3278, 3278-2, 3278-3, 3278-4, 3278-5. 3270 and 3278 are treated as convenient shorthand for 3278-2
host	Yes	1	The telnet target host name or IP address.
service	No	0 or 1	The service name or number (default=23). Any port that allows telnet connections can be used. Valid predefined services are listed in <i>/etc/services</i> .
screen_buffer_size	No	0 or 1	Defines the screen buffer size for consoles of iotype=HP700/92 that can display a window (screen) of a larger size. Default is “500”. At least one screen of data (24 lines) is allocated. If the number entered is not a multiple of 24, it is rounded up – for example, an entry of 34 is rounded up to 48. The recommended maximum is 960 – higher numbers will increasingly affect performance.
PingThreshold	No	0 or 1	If the MCC does not detect activity on the telnet connection for this number of seconds, it sends a ping. If not specified or “0”, no ping is sent, regardless of how long the connection is inactive. The value is rounded up to the nearest 10 seconds – for example, “PingThreshold=17” would cause a ping to be sent after 20 seconds of inactivity.
PingResponse	No	0 or 1	If the MCC does not receive a response to a ping it sent on the telnet connection for this number of seconds, it closes the connection. If not specified, it defaults to the same value as PingThreshold. If set to “0”, the ping functionality is disabled. The value is rounded up to the nearest 10 seconds – for example, “PingResponse=23” would cause the connection to be terminated after 30 seconds without a response.

Table 21 Console Section, telnet keys

**Telnet service Key Values**

If not specified, the service key defaults to 23, the default telnet port. Other ports that allow telnet connections can be specified using this key.

**Example**

```
[console DEC-UNIX-Telnet]
interface=telnet
iotype=VT100
host=localhost
days_history=1
audit=yes
```

```
[console PS340-telnet]
interface=telnet
iotype=VT100
host=206.144.7.58
no_printer
#the next example telnets to port 6500 on PS340
```

```
[console PS340-telnet]
interface=telnet
iotype=VT100
host=206.144.7.58
service=6500
#this example opens up a telnet connection on port 32145
```

```
[console HP Console]
interface=telnet
host=hpuc
iotype=VT100
lock_timeout=5
days_history=5
```

```
[console DEC-HITELNET]
interface=telnet
iotype=VT100
host=192.168.1.7
service=32145
days_history=7
```

```
[console Terminal Server]
interface=telnet
host=192.168.14.219
service=2001
days_history=5
```

```
iotype=VT100  
PingThreshold=20  
PingResponse=30
```

*Note:* Use `interface=telnet-standardclient` in place of `interface=telnet` to select the DEC telnet client. Both `interface=` specifications may be included in the same `system.cfg` file if connecting to different console types.

Refer to *Chapter 3 Selecting Consoles* in the *Operations Guide* for information on using HP700 consoles.

## Printer Section

The printer section defines a printer console connection. The printer section name determines the name of the printer emulator icon. Printer consoles can be defined for ICON, and telnet sessions. The printer session must have the same parameters (for example, `stty_flags`, newline specification, and operating mode) as the related glass console session, or error messages will be generated. .

### **Examples**

#### Printer Console

```
[printer AS400 PRINTER]
interface=Telnet

Icon=Unit2
host=Lpar1
days_history=1
```

## Command Console

The Command Console section defines a command console that runs a defined command or Unix shell script when selected. For example, the Command Console can be used to:

- Provide Windows NT console consolidation using the VNC product (see <http://www.uk.research.att.com/vnc>) and Netscape Navigator. The VNC executable must be configured on the NT workstation or server. The VNC X-windows viewer or a Java-capable browser such as Netscape Navigator must be installed on the MCC. Notes and examples on this implementation are given later in this section.
- Run an X windows application on the local MCC host.
- Run an X windows application on a remote host.

When the command console starts, a message in the format “Starting Command Console <specified console>” appears in the Execution Log.

*Note:* A Command Console permits user updates, and it is not possible to define read-only access.

## Valid Keys

Table 22 lists the valid Command Console section keys in the system.cfg file:

Key	Required?	Quantity	Description
interface	Yes	1	The type of interface. Always Command.
command	Yes	1	The command or script to execute when a user selects the console.
Categories	No	0 or 1	Assign the console to one or more categories. Category names are not case sensitive, and appear in the Console Selection window. If not specified, the console will only appear in the <b>ALL</b> category.

*Table 22 Console Section, Command Console Values*

## Examples

The following example provides console consolidation of a Windows NT server through Netscape Navigator installed on the MCC. The VNC executable must be installed on the NT server.

```
[console NTServer]
interface=command
command=netscape http://NTServer:5800
categories=Command
```

The following example displays the index of the MCC manuals in a Netscape Navigator browser on the MCC workstation.

```
[console MCC Manuals]
interface=command
command=netscape file:/usr/ics/etc/doc/manual/html/index.html
categories=Command
```

The following example runs an X-windows application called xeyes from the command console.

```
[console xeyes]
interface=command
command=exec /usr/bin/X11/xeyes
categories=Command
```

## Recommendations on Command Console Implementation

### *Using Running Applications*

The command must handle multiple requests for the same command console. This functionality is supported by some applications such as Netscape Navigator, which has a “-remote openURL(…)” option to use an existing Netscape process. Refer to [examples/commandconsoles/reuse-netscape](#) for more information.

### *Using Scripts*

Whenever possible, implement a command console by calling a script instead of a command, as it avoids the need to restart the MCC to reread the configuration file.

### *Signal Handling*

Some applications such as xterm do not exit when SIGHUP is received. In such cases, use a script that forwards signals to a child process. The child process takes the same environment variables as the parent. Refer to [examples/commandconsoles/map-signals](#) for a sample script. Since gwconsole (the process that runs the console window) kills child processes on exit, the application should be defined as the child process. However, gwconsole uses ksh to run the command to allow shell quoting, so do one of the following:

- Use `exec` to have `ksh` execute the command without forking. This can be included in the script or in the command as shown in the preceding example. For additional examples, refer to `examples/commandconsoles/reuse-netscape` and `examples/commandconsoles/launch-x-vnc`.
- Include the command in a script that forwards signals to the child process. Refer to `examples/commandconsoles/map-signals` for an example script.

### **Using Exec**

In most cases, `exec` can be specified in the command. This technique minimizes the number of processes and may improve signal handling. Every command is started as `"/bin/ksh/ -c command"`, and can equally well be started as `"/bin/ksh -c exec command"`. However, `exec` cannot be used if the command has shell-specific operations. For example, the following command cannot be used with `exec`:

```
ENVVAR=value printenv
```

Instead, use the following:

```
Export ENVVAR=value; exec printenv
```

### **How the MCC handles Commands**

- Processes are `fork()`ed and `exec()`ed as `"/bin/ksh", "-c", "<specified command>"`. The command does no substitution of any text or variables, and no additional arguments are provided.
- The child process has the same environment as the parent process, including environment variables, `stdout`, and `stderr`.
- The MCC attempts to kill child processes by sending a HUP signal to each child process when the `gwconsole` process exits when the user logs out. There may be cases where `gwconsole` is killed before it completes this action, for example, if the user exits an X session without logging out of MCC. The specified command can take actions that would circumvent the MCC from knowing the application process, and/or preventing the killing of the application with a `SIGHUP`.
- Each command is responsible for preventing multiple windows for the same console for a user. The command is also responsible for preventing concurrent access by multiple users.

## **Consolidation of Windows NT Consoles via VNC**

<p><i>Note:</i> Visara does not support or resell VNC. It is freeware available from and supported by the vendor, AT&amp;T. Visara makes the customer aware of the VNC product, and the customer assumes all risks associated with the implementation of VNC-based solutions.</p>
---

VNC (Virtual Network Computing) is a product that allows a computer system environment to be viewed and manipulated from another system across a high-speed data network. Integrated with the MCC, the VNC product allows a MCC operator to monitor and control the graphical interface of distributed Windows NT systems from a single console, namely the MCC terminal. The VNC software:

- Accepts connections from the MCC.
- Accepts inputs including mouse movements and keystrokes from the MCC workstation.
- Sends the Windows NT GUI interface over the network back to the MCC.

Once installed, the VNC software allows a MCC operator to take full control of the Windows NT environment from a remote location.

#### ***What VNC does in the MCC environment***

- VNC displays the graphical user interface of Windows NT systems within the MCC environment, allowing a MCC operator to manage and control distributed Windows NT systems.
- VNC accepts the Ctrl-Alt-Del keystroke combination through a button integrated in the browser's graphical interface or a softkey in the X-windows viewer. This allows the MCC operator to initiate a logon sequence from the command console, and to securely lock the Windows NT system after the administration tasks are completed.

<p><i>Note:</i> VNC does not provide a multi-user environment on Windows NT. All users share the same environment.</p>
--

#### ***Prerequisites***

- The VNC executable must be installed on each Windows NT server to be monitored from the MCC. The executable occupies approximately 175 KB of disk space on the server. It is installed as a service that runs on start up without requiring a user to log on.
- Each Windows NT server must have its own command console configured in the system.cfg file. Examples of how to do this are given in the preceding *Examples* section.
- The optional VNC viewer is contained in a 2.5 MB tar file called VNC.tar that is installed on the MCC. The tar file includes a readme file that provides installation instructions.
- If a Web browser is used instead of the VNC viewer, the Windows NT environment is accessed by pointing the browser to `http://<servername>:5800`. For example, to access a Windows NT server called NT4, enter `http://NT4:5800`.
- VNC is intended for use over a LAN, such as a shared 10BaseT network. Performance over modem links is generally unacceptable.

## **Security**

VNC is configured with a password during installation. This password must be supplied at connection time by any MCC user wishing to access the Windows NT server from the VNC viewer or a Web browser. This stand-alone password is not associated with an NT user domain account.

### **Installing the VNC Software**

To provide access for monitoring and controlling a Windows NT server from the MCC:

1. Obtain the VNC software. Refer to <http://www.uk.research.att.com/vnc>.
2. Install the VNC server software on the Windows NT server, following the instructions in the VNC readme file.
3. Optionally, install the VNC viewer software on the MCC server, following the instructions in the VNC readme file. A Java-capable Web browser may be used as an alternative to the X Windows viewer, if one is installed on the MCC server.
4. If using the VNC viewer, enter the command 'vncviewer <hostname>:<display>', where <display> is typically equal to 0 (zero), for example, vncviewer nt4:0. If using a Web browser, enter the command 'http://<hostname>:5800'. If either case, ensure the Windows NT environment is displayed with default parameters.
5. Enter the required password and verify correct access is available to the Windows NT environment.
6. Define a command console for the Windows NT system, as shown in the *Examples* on page 97.
7. If using the VNC viewer, consider defining softkeys (see page 58) for important Windows NT keystrokes and functions such as Ctrl+Alt+Del. It is not necessary to define softkeys if using the browser interface, as all functions should be available.

<p><i>Note:</i> If the system tray icon is not visible in the Windows NT environment, run 'winvnc -settings'. This displays a dialog that allows VNC settings and the security password to be edited.</p>
---

## Unit Section

The unit section defines a unit device for a CPU. The unit section name determines the name of the unit icon.

Names must be eight characters in length or less.

## Valid Keys

Table 23 lists the valid key requirements:

Key	Required?	Quantity	Description
number	Yes	1	The unique unit number (logical unit number). Specified in hex.
address	Yes	1	Specified in hex.
type	Yes	1	Specified in hex.
channel	Yes	1	Specified in hex.
startup_status	No	0 or 1	The initial color for the unit icon. See <i>status.cfg: Status Colors</i> on page 53.

Table 23 Console Section, Unit Keys

## Example

```
[unit DASD1]
number=1
address=320
type=3380
channel=1
```

```
[unit MT1]
number=2
address=330
type=3480
channel=1d
```

## MVS Configuration

The MVSConfig section defines the MCC environmental values for connection to MCCSTARS.

### Valid Keys

Table 24 lists the valid key requirements of the MVSConfig section:

Key	Required?	Quantity	Description
workstationid	Yes	1	The workstation's identification to the MVS Agent.
retrytime	Yes	1	How often to retry failed connections to the agents. Specified in seconds.

*Table 24 MVS Section, Valid Keys*

## MVS Agent Section

Table 25 lists the valid key requirements for each MVS Agent section:

Key	Required?	Quantity	Description
userid	Yes	1	The userid that identifies the MCC to the MVS Agent.
password	Yes	1	The password to authenticate the MCC to the MVS Agent.
version	Yes	1	The version of the protocol between the MVS Agent and the MCC. Set to '2' for the old version of WatchMVS. Set to '3' for MCCStars
release	Yes	1	The release of the protocol between the MVS Agent and the MCC. Set to '1' for this version of the MCC.
retrytime	Yes	1	How often to try resending failed commands to the agent. Specified in seconds.
ipaddress	Yes	1	Ip address of the host running the WatchMVS / MCCStars MVS Agent
ipport	Yes	1	Ip port number on which the WatchMVS / MCCStars agent is configured to accept connections.

*Table 25 MVS Agent Section, Valid Keys*

**Example:**

```
[MVSConfig]
retrytime=10
```

```
[MVSAgent QuuxAgent]
userid=WATCHECS
password=0x0123456789ABCDEF
version=3
release=1
retrytime=50
ipaddress=192.168.0.22
ipport=2769
```

```
[MVSAgent AlphaAgent]
userid=WATCHECS
password=0x0123456789ABCDEF
version=3
release=1
retrytime=50
ipaddress=192.168.0.23
ipport=2769
```

## Chapter 6 Defining and Changing OS Groups

This chapter describes how to assign operating systems to logical groups, and how to modify existing groups.

### Introduction

An OS Group is a logical group of operating systems. There are no predefined rules for groups, and it is not necessary that all member operating systems are of the same type or in the same physical location. They may be grouped together according to purpose, physical location, operating system type, or even physical CPU height. The only requirement is that all members of OS groups must be defined in the `system.cfg` file.

Event Manager uses OS Groups for console message rules. Event Manager can be configured so that a particular rule applies to an OS group. Thus, the same console message can be treated differently, depending on which group issued the message. For example, Operations may wish to treat ABENDs on production systems differently from ABENDs on test systems. Thus, all test systems would be in one OS group, and all production systems would be in a different OS Group. See the Event Manager section for more details on Console Messages.

## Editing OS Groups

To edit OS Groups, select the **Administration** menu **Configuration:OS Group** option. The System Configuration Editor window appears.

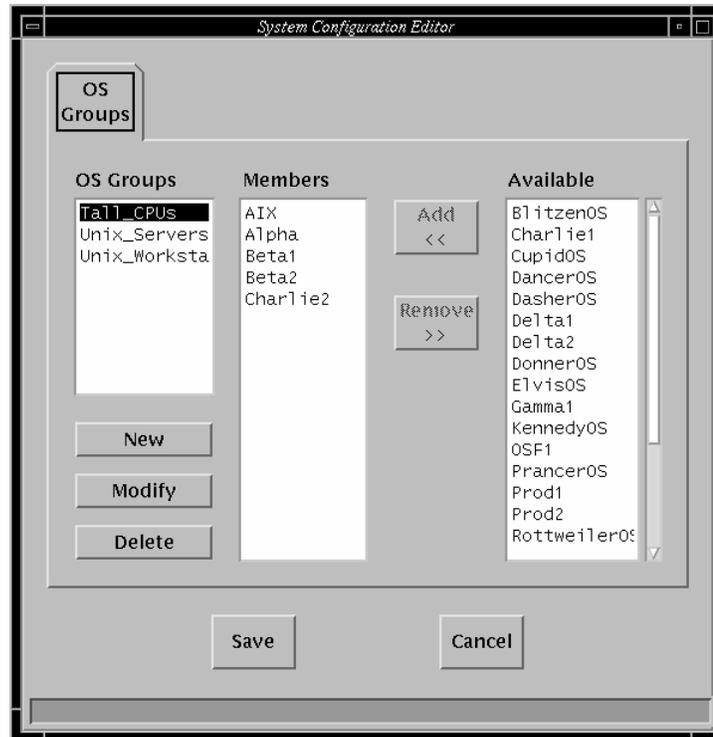


Figure 10 System Configuration Editor window (OS Groups)

The System Configuration Editor window displays OS groups configured on the MCC system. The Members list box contains operating systems that are members of the currently selected OS group. The **Available** list box displays those Operating Systems defined in the system.cfg file that are not members of the selected group.

### Creating a new OS group

1. Click the **New** button.
2. The Modify OS Group window appears.



Figure 11 Modify OS Group window

3. Enter the name in the **OS Group Name** text box.
4. Click the **OK** button.

### Adding an operating system to the selected group

1. Select an operating system from the **Available** list box.
2. Click the **Add** button. The operating system is added to the **Members** list box.

### Removing an operating system from the selected group

1. Select an operating system from the **Members** list box.
2. Click the **Remove** button. The operating system is removed from the **Members** list box.

### Modifying an OS group

1. Select an OS group from the **OS Groups** list box.
2. Click the **Modify** button.
3. The Modify OS Group window appears (see *Figure 11*).
4. Enter a new name in the **OS Group Name** text box.
5. Click the **OK** button.

## Deleting an OS group

1. Select an OS group from the **OS Groups** list box.
2. Click the **Delete** button.

*Note:* Do not change the name of or delete an OS group if the group is in use. Modify all relevant Event Rules before deleting or renaming the OS Group.

To save changes, from the System Configuration Editor window click the **Save** button. The changes are committed to the `osgroup.cfg` file. Changes become effective within Event Manager the next time the MCC system starts.

## Chapter 7 Setting Up SNMP

This chapter describes how to configure the MCC to utilize the optional SNMP (Simple Network Management Protocol) capability of the MCC, including:

- Configuring an SNMP Agent.
- Configuring SNMP Agent Groups.
- Using SNMP from Scripts.
- MIBs available on the MCC.

## Overview

The MCC optionally allows communication with any networked host using the Simple Network Management Protocol (SNMP). The MCC is capable of sending and receiving SNMP traps, and getting and setting MIB values.

To utilize SNMP capabilities within the MCC, definitions must first be configured using the SNMP Editor. The editor is available from the Master window **Administration** menu—**Configuration:SNMP Setup** option. Update permission for the “Configure: SNMP” security privilege is required to access this option.

Once SNMP configuration is complete, Event Manager may be configured to monitor SNMP Traps. Also, scripts capable of sending SNMP Traps, and getting or setting MIB values on another SNMP agent can be written.

After selecting the SNMP Setup option, a window similar to SNMP Editor window below appears.

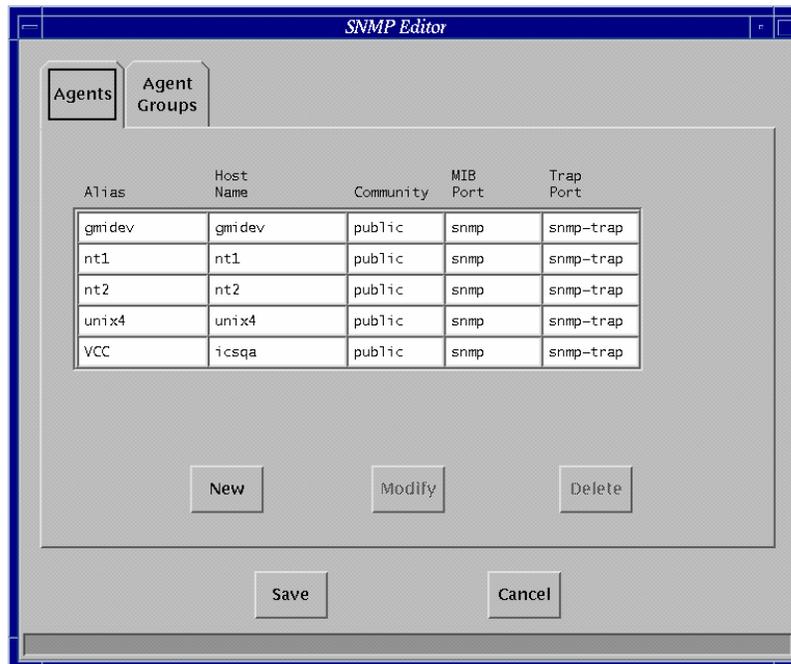


Figure 10 SNMP Editor, Agents Tab

The SNMP Editor window allows you to view agents and agent groups configured on the system. There are two tabs:

- **Agents** tab displays the Alias, host name, community, MIB port, and trap port for SNMP agents.
- **Agent Groups** displays agents and add agent groups.

## Definitions

- An **SNMP agent** is a managed host that can communicate using the SNMP protocol.
- **SNMP Agent Group.** Within the MCC, the concept of SNMP agent groups is simply a logical grouping of SNMP agents. Agent groups are useful within Event Manager for limiting an SNMP trap event rule to some, but not all, of the configured agents.

## Configuring an SNMP Agent

To configure a new SNMP agent or modify an existing agent:

Figure 11 SNMP Agent window

1. From the **Agents** tab, click the **New** or **Modify** button (depending on what you are trying to accomplish). The SNMP Agent window appears.
2. Enter the information in the appropriate text boxes:

**Alias** The name to use within the MCC. It is possible to configure multiple agent entries for the same SNMP agent, specifying different values for Community, Trap, and MIB ports.

*Note:* It is strongly recommended that the Alias name match the OS name on the host. This makes it possible to use the OS name as the \$alias parameter for SNMP script commands. Otherwise, a script has no way of knowing what the SNMP agent name is.

**Host Name.** This is the host name or IP address of the agent.

**Community.** The community used when accessing MIB values. The default is “public”. To identify the required SNMP community, refer to the documentation for the agent with which the MCC will communicate.

**Trap Port.** Normally, set to the default port number of 162. However, it is possible that some agents may communicate on a different port number.

**MIB Port.** Normally set to the default MIB port number of 161.

3. Click the OK button.

### **Saving changes to the agent**

Click the **OK** button. The SNMP Editor will perform a few data checks, warning of potential problems prior to exiting this window. Changes do not become permanent until Save is selected in the main window.

Clicking the **Cancel** button at any time will abandon all changes.

## Configuring SNMP Agent Groups

From the SNMP Editor window, it is possible to add agents, add agent groups, modify existing agents, and delete agents. Click the **Agent Groups** tab on the SNMP Editor window to bring the **Agent Groups** tab to the front.

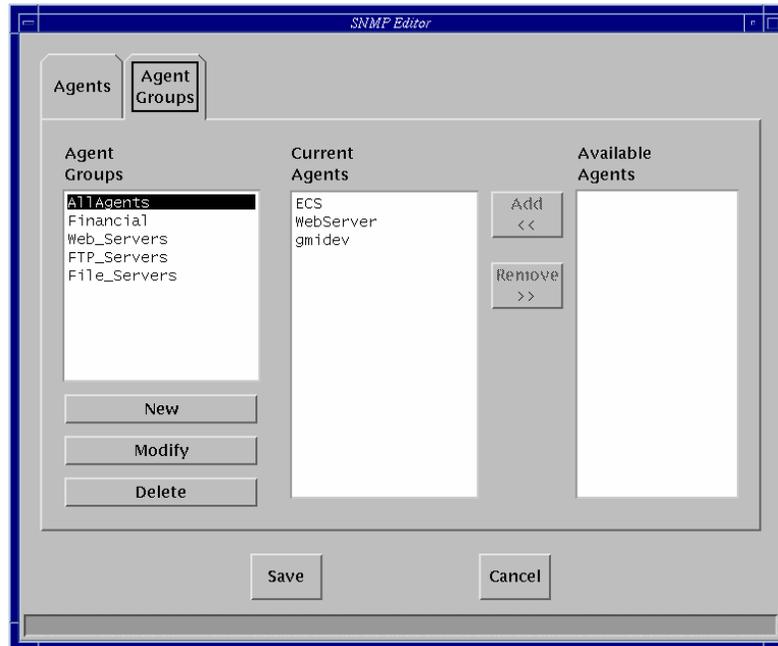


Figure 12 SNMP Editor, Agent Groups tab

The **Agent Group** list box contains all the defined agent groups. When you select an agent group, the **Current Agents** list box displays the configured agents that are members of the group. The **Available Agents** list box displays the configured agents that are NOT members of the group.

### Adding an agent to the Current Agents list

1. Select the agent to move from the **Available Agents** list box.
2. Click the **Add** button.

The agent is added to the Current Agents list box.

### Removing an agent

1. Select the agent to move from the **Current Agents** list box or the **Available Agents** list box.
2. Click the **Remove** button.

The agent is removed from the list box.

## Creating a new agent group

1. Click the **New** button. The Agent List window appears.



Figure 13 Agent List window

2. Type the name of the new agent group.
3. Click the OK button.

The new agent group is added to the Agent Groups list box.

## Modifying an agent group

1. Click the **Modify** button. The Agent List window appears (see *Figure 15*).
2. Type the new name of the agent group.
3. Click the **OK** button.

The name change can be viewed in the Agent Groups list box.

*Note:* The SNMP Editor ensures the selected name is unique. A warning is displayed indicating that changing the group name may affect other configurations. SNMP Editor does not update the Event configuration, so changing or deleting an agent group (or agent) may result in errors if changes are not also made in the Event Editor.

## Using SNMP from Scripts

The SNMP commands available in the GCL scripting language are:

Command	Explanation
SNMP_TRAPSEND	Sends a trap to an agent.
SNMP_GET	Gets a MIB value from an agent.
SNMP_GETNEXT	Gets the next MIB value from an agent (see the <i>Scripting Guide</i> for a complete description).
SNMP_SET	Sets a MIB value on an agent.
SNMP_GETTABLE	Gets all values from an MIB table.

Table 26 SNMP Commands in GCL Scripting Language

Refer to the *Scripting Guide* for detailed information on using SNMP from a script.

## MIBs Available with the MCC

To access SNMP variables that are not in the default MIBs that the MCC works with, it is necessary to add MIB definitions to the MCC. By default, the MCC understands MIB-II, the Host Resource MIB, and the RMON MIB. The `/usr/ics/mib` directory also has many other standard MIBs that may be added to MIBs the MCC understands. Other MIBs not found in this directory may also be added. Typically these will be product or vender specific MIBs (for example, a MIB for HP LaserJet printers). The following table lists the standard MIBs the MCC ships with and the file in which each MIB may be found.

MIB	File MIB Is Located In
MIB-II	Rfc1213.mib
SMUX	Rfc1227.mib
Interface Extensions	Rfc1229.mib
Token Bus	Rfc1230.mib
Token Ring	Rfc1231.mib
DS1	Rfc1232.mib
DS3	Rfc1233.mib
CLNS	Rfc1238.mib
AppleTalk	Rfc1243.mib
OSPF	Rfc1248.mib
OSPF	Rfc1252.mib
OSPF	Rfc1253.mib
BGP	Rfc1269.mib
RMON	Rfc1271.mib

<b>MIB</b>	<b>File MIB Is Located In</b>
FDDI SMT 6.2	Rfc1285.mib
Bridge	Rfc1286.mib
DECnet Phase IV	Rfc1289.mib
SIP	Rfc1304.mib
Frame Relay	Rfc1315.mib
Character	Rfc1316.mib
RS-232	Rfc1317.mib
Parallel Printer	Rfc1318.mib
Party	Rfc1353.mib
IP Forwarding Table	Rfc1354.mib
Repeater	Rfc1368.mib
X.25 LAPB	Rfc1381.mib
X.25 Packet Layer	Rfc1382.mib
RIP	Rfc1389.mib
Ethernet like	Rfc1398.mib
DS1/E1	Rfc1406.mib
DS3/E3	Rfc1407.mib
Identification	Rfc1414.mib
Multiprotocol Interconnect over X.25	Rfc1461.mib
PPP LCP	Rfc1471.mib
PPP SEC	Rfc1472.mib
PPP IP NCP	Rfc1473.mib
PPP Bridge NCP	Rfc1474.mib
Bridge	Rfc1493.mib
FDDI 7.3 SMT	Rfc1512.mib
Token Ring RMON	Rfc1513.mib
Host Resource	Rfc1514.mib
MAU	Rfc1515.mib
SNMP Repeater	Rfc1516.mib
Source Routing	Rfc1525.mib
DECnet Phase IV	Rfc1559.mib
Ethernet Like	Rfc1623.mib
Ethernet Like	Rfc1643.mib
AppleTalk	Rfc1742.mib
RMON	Rfc1757.mib
TCP/IPX	Rfc1792.mib

*Table 27 List of Standard MIBs for the MCC*

## Adding a MIB

1. Open a Unix shell window.
  2. In that window, change directory by entering
3. Concatenate together the ASN.1 file along with all the MIBs you want to be able to access. The ASN.1 file contains the MIB-II definition as well as some other definitions that must be present. For example:

```
cd /usr/ics/mib
```

```
cat ASN.1 rfc1514.mib rfc1757.mib > customMib.tmp
```

4. Enter
- ```
run /usr/ics/bin/makemib -out customMib.db customMib.tmp
```
5. If error or warning messages occur, they may be due to a non-standard MIB — fix the MIB or do not use it.

|                                                                                                                                                   |
|---------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><i>Note:</i> The name of the <code>-out</code> file must be <code>customMib.db</code> and it must be located in <code>/usr/ics/mib</code>.</p> |
|---------------------------------------------------------------------------------------------------------------------------------------------------|

6. Shut down and restart the MCC. This stops and restarts the Event Manager so that it can use the new MIB file. Scripts that utilize SNMP can use the new MIB variables next time they run.



## Chapter 8 Administering Users

This chapter discusses:

- Administering security for groups including changing permissions.
- Displaying and modifying MCC users. Adding or deleting users from groups.
- Displaying and modifying login users; adding or deleting users.

## Introduction

Administering MCC users includes adding, removing, and maintaining MCC users and their privileges. Proper administration requires a thorough understanding of the group-level security used in the MCC.

The MCC uses group-level security. Unlike in operating systems, users have no individual access rights. All rights are assigned to groups. Users belong to one or more groups.

There are three levels of security for MCC “items” such as consoles and OSs:

- None.
- VIEW.
- UPDATE.

If a group is given a permission level of NONE for an item, users belonging to that group do not have any access to that item. For the following examples, assume there is a security group called “Operator” and an OS called “Prod”:

- If the Operator group is given NONE access to Prod, no member of the Operator group sees any icon from Prod on the Console Selection window.
- If the Operator group is given VIEW access to Prod, any member of the Operator group can view any of the consoles of Prod, but cannot update or type in them.
- If the Operator group is given UPDATE access to Prod, any member of the Operator group can enter commands on any of Prod’s consoles.

If a group has NONE access to a particular system’s consoles, users in that group do not see the console icons in the Console Selection Window. However, those users can see the OS and CPU icons in the System Summary window.

If a user belongs to more than one group, the user has the most permissive level of security of the two groups. For instance, if group “Operator” has a level of NONE access for the OS “Prod” and group “Administrator” has a level of UPDATE for the same OS, any user belonging to both “Operator” and “Administrator” has a level of UPDATE.

*Note:* The maximum number of users permitted on the MCC is determined by the terms of your contract with Visara. If the number of users needing access to the MCC exceeds the contracted number, contact Visara technical support for a license upgrade.

## What is the difference between MCC Users and Login Users?

“Users” are normally individuals who access the system. However, within the MCC programs, it is important to understand the difference between “MCC Users” and “Login Users”.

- “Login Users” correspond to login accounts on the MCC host (that is, Unix accounts). At a “Login:” prompt, the user enters the Login User’s login name and password. This level of security is managed by the MCC host operating system, i.e. RedHat Linux.
- “MCC Users” corresponds to the users configured to use the MCC software. This is a subset of the Login Users. This level of security is managed by the MCC software.

|                                                                                                   |
|---------------------------------------------------------------------------------------------------|
| <p><i>Note:</i> Each MCC User account must also have a Login User account with the same name.</p> |
|---------------------------------------------------------------------------------------------------|

## Administering Security

Changes to the MCC security configuration are made from the Security Editor window. From the MCC master window, select the **Administration** menu—**Configuration: Security** option. The Security Editor window appears.

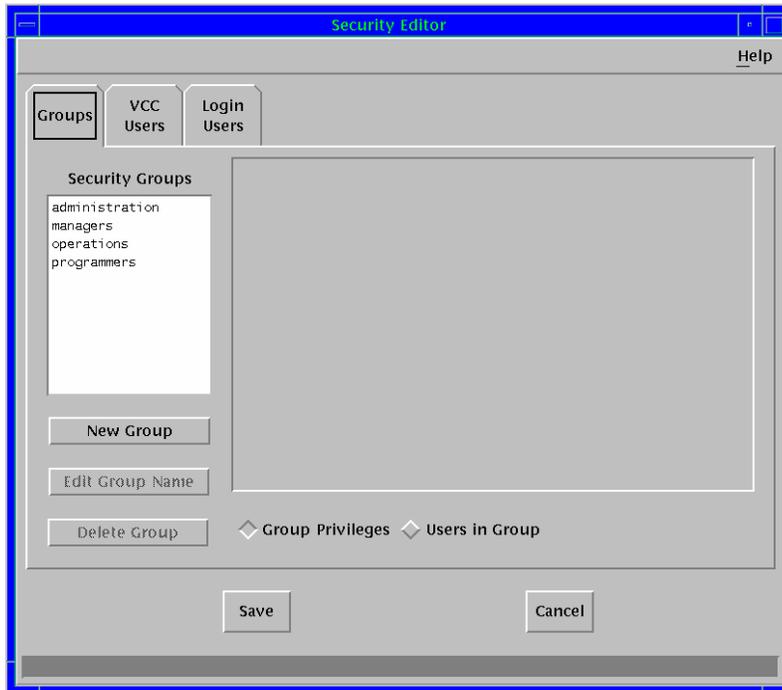


Figure 14 Security Editor window, Security Groups tab

From the Security Editor window, it is possible to modify, add, and delete:

- Security groups.
- MCC users.
- Login users.

Changes made within the Security Editor window (except for working with Login Users) are not saved until the **SAVE** button is clicked. This action then saves the configuration and exits Security Editor. Login Users changes are effective next time the user logs in, and changes are permanent.

## Group Security

### Adding Security Groups

To add a security group:

1. From the Security Editor window **Groups** tab, click the **New Group** button. The Add/Update Security group window appears.
2. Enter a name in the **Name:** text box.
3. Click the **OK** button. The Add/Update Security group window asks if you are sure if you want to create a new security group.
4. Click the **Create Group** button. The new group appears in the **Security Groups** List.

New groups are created with all privileges set to “None”.

|                                                                                                               |
|---------------------------------------------------------------------------------------------------------------|
| <p><i>Note:</i> Security Group names cannot have spaces in them. Use an underscore “_” character instead.</p> |
|---------------------------------------------------------------------------------------------------------------|

### Deleting Security Groups

To delete a security group:

1. From the Security Editor window **Groups** tab, select a security group from the **Security Groups** list box.
2. Click the **Delete Group** button. A dialog appears confirming the deletion.
3. Click the **Delete Group** button.

### Saving Changes to Group Privileges

From the Security Editor window, click the **Save** button.

## Viewing Security Group Permissions

To view the security group permissions, from the Master window, select the **Administration** menu **Configuration—Security** option. The Security Editor window appears. The Groups tab should be in front by default.

The **Group Privileges** and **Users in Group** toggle buttons near the bottom of the Security Editor window modify the display.

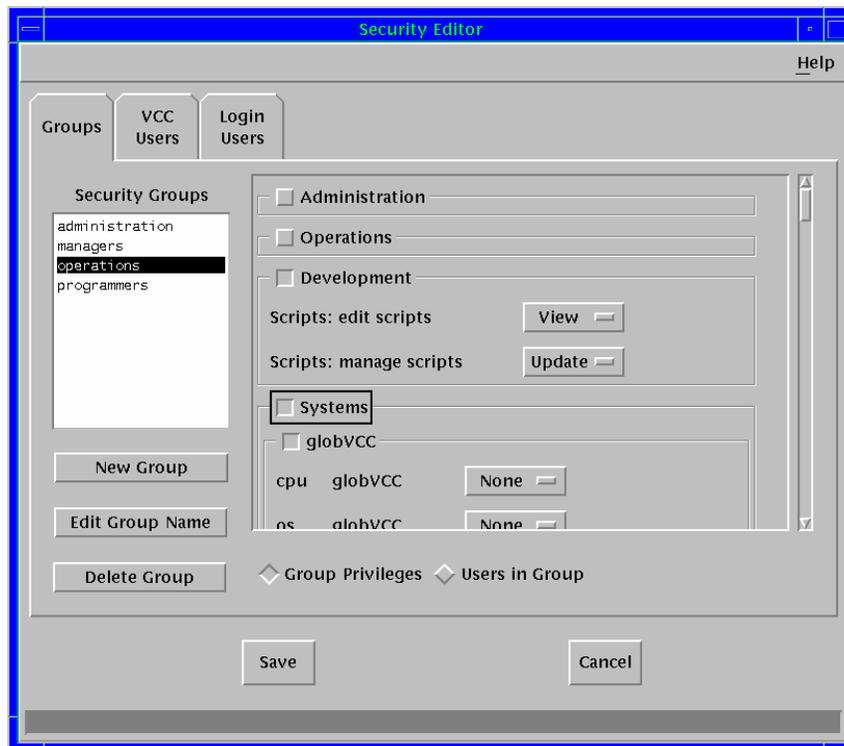


Figure 15 Security Editor window, Groups tab

To view security group permissions:

1. From the Security Editor window **Groups** tab, select a group from the **Security Groups** list box.
2. Click the **Group Privileges** toggle button to display the group's privileges.
3. Select the **Administration**, **Operations**, **Development**, or **Systems** toggle button for more information.

*Note:* The **Security Editor** window **Groups** tab includes the option to allow members of a group to send and receive broadcast messages. Both View and Update permissions allow group members to send and receive messages.

## Setting Security for Consoles

By default, members of a security group do not have access to a console. The group permissions must be changed to VIEW (read-only access) or UPDATE (read/write access) to allow access to the console. Changes only take effect when a user logs out and back in again.

### *Console for CPU:OS combination:*

If a console is defined in both CPU and OS sections of the system.cfg file (see Chapter 5 MCC system.cfg Configuration File), the **cpu** and **os** selections must be set to **Update** for members of the security group to have full access to the console.

*Note:* Defining both a CPU and an OS for a console is a typical configuration. It allows the console to be referenced by GCL scripts, and permits a Console History Log to be generated.

### *Console for CPU:*

If a console is defined in the CPU section of the system.cfg file and not in the OS section, the **cpu** selection must be set to **Update** for members of the security group to have full access to the console.

*Note:* If no OS is defined on a CPU, the **os** selection and drop-down list are not shown.

### *Standalone Console:*

If a console is not associated with a CPU or an OS, setting the **Other** selection to **Update** allows members of the security group full access to the console.

### *Console with VIEW Permissions:*

A console with VIEW permissions set contains a “View Only” status indication in the status bar at the bottom of the console window. A console of this type behaves like a printer console.

*Note:* A Command Console with VIEW permissions behaves as if UPDATE permissions are set. The user has full read and write access to the console.

## Viewing Security Group Members

To view users in a security group:

1. From the Security Editor window **Groups** tab, select a security group from the **Security Groups** list box.
2. Select the **Users in Group** toggle button to display users assigned to the selected security group.

Users in the selected security group appear in the text box to the right of the **Security Groups** list box.

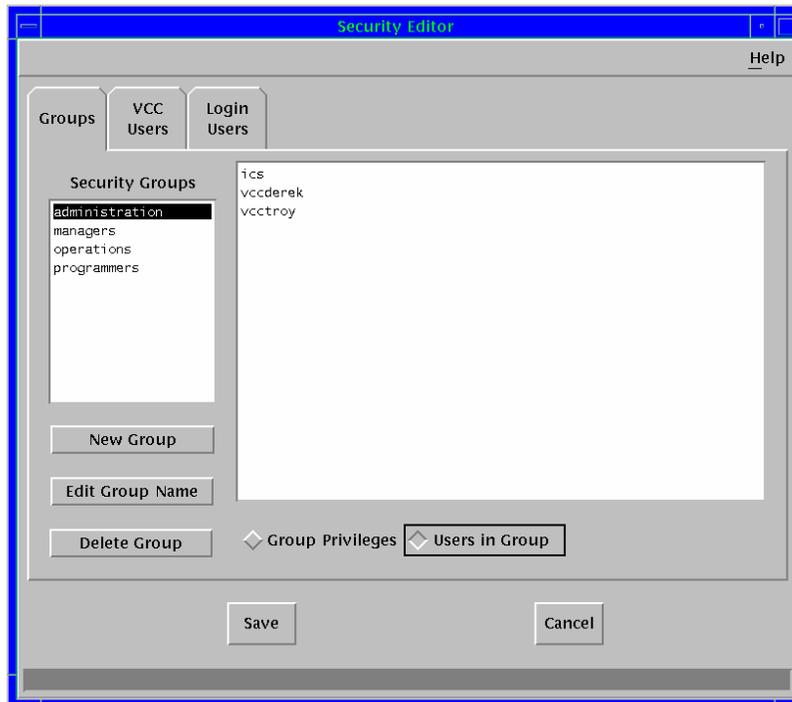


Figure 16 Security Editor window, Group Members

This is a view-only window. It is not possible to add or remove users here—that must be done in the **MCC Users** tab.

## Viewing and Changing MCC Users

From the Master window, select the Administration menu **Configuration:Security** option. Click the **MCC Users** tab to display users and current groups.

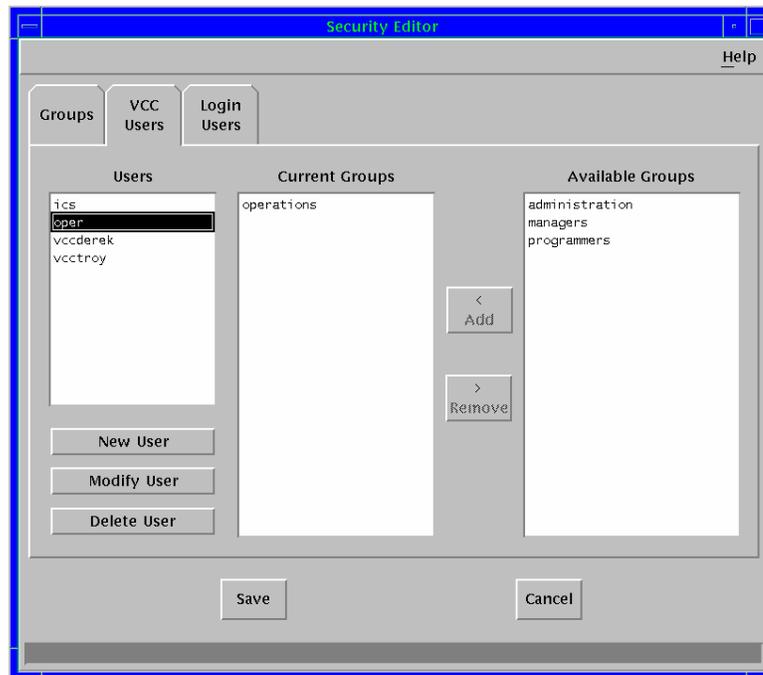


Figure 17 Security Editor window, MCC Users tab

From the Security Editor window, **MCC Users** tab it is possible to:

- Add a MCC user to a security group.
- Remove a MCC user from a security group.
- Create a new MCC user.

## Creating a new MCC User

When adding a new user, both a MCC user and a Unix login user must be defined for the user account.

To add a new MCC User:

1. From the Security Editor window **MCC Users** tab, click the **New User** button. The Add MCC User window appears.

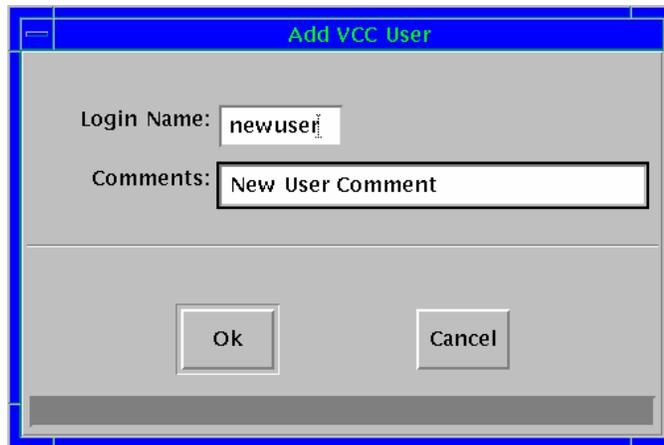


Figure 18 Add New MCC User window

2. Enter the new user's name in the **Login Name:** text box.

*Note:* It is critical that the Login Name entered in this window matches exactly the login name entered when the Login User was created.

3. Type any comments in the **Comments:** text box.
4. Click the **OK** button. A new MCC user is created.

*Note:* New users do not initially belong to any security groups. Be sure to add the security groups desired. If at least one security group is not specified for the new user, an error message appears when Save is selected, stating that no changes were made.

### Adding a MCC User to a Security Group

To add a user to a security group:

1. From the Security Editor window **MCC Users** tab, select a group from the **Available Groups** list box.
2. Click the **Add** button.
  - The group name then appears in the **Current Groups** list.
  - A shortcut to clicking the **Add** button is to double-click the group name in the **Available Groups** list box.

### Deleting a MCC User

To delete a MCC User:

1. From the Security Editor window **MCC Users** tab, select the user from the **Users** list box.
2. Click the **Delete User** button. A dialog appears, asking to confirm the deletion.
3. Click the **OK** button.

### Removing a MCC User from a Security Group

To remove a user from a security group:

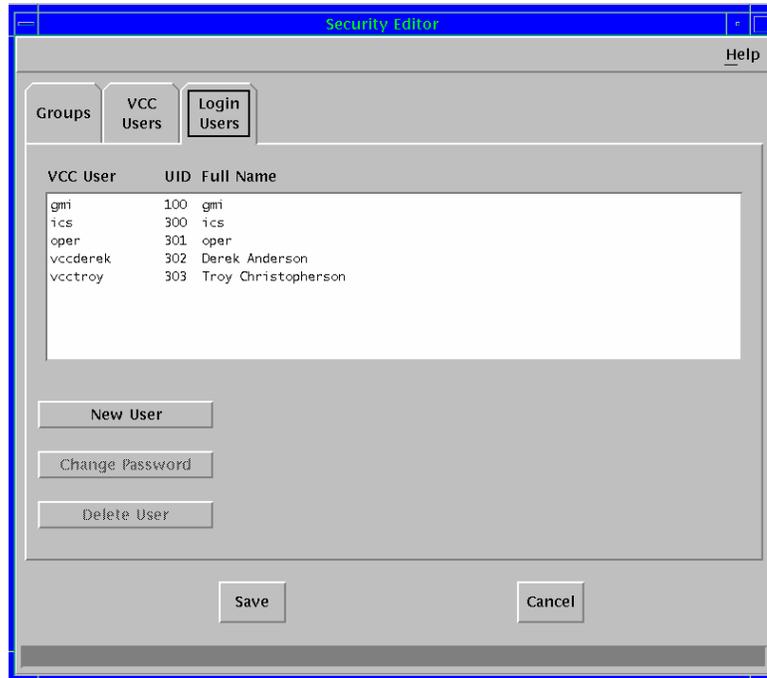
1. From the Security Editor window **MCC Users** tab, select the group to delete from the **Current Groups** list.
2. Click the **Remove** button.

|                                                                                                                                              |
|----------------------------------------------------------------------------------------------------------------------------------------------|
| <p><i>Note:</i> A shortcut to clicking the <b>Remove</b> button is to double-click the group name in the <b>Current Groups</b> list box.</p> |
|----------------------------------------------------------------------------------------------------------------------------------------------|

## Viewing and Changing Login Users

Users are created, modified, and deleted from the Security Editor window **Login Users** tab. From the Master Console Center master window, select the Administration menu **Configuration: Security** option. The Security Editor window displays. Click the **Login Users** tab to display a list of login users.

*Note:* All users in Unix group “ics” are displayed.



*Figure 19 Security Users window, Login users*

From the **Security Editor**—window **Login Users** tab, it is possible to:

- Create new login users.
- Change a user’s login password.
- Delete a login user.

## Modifying Login Users

**Caution:** When working with login users, changes are being made to the OS user system accounts immediately. These changes cannot be reversed.

The Security Editor does not directly modify the list of Login Users. Thus, selecting a user in the list has no effect on the program operation for New User or Delete User. However, it does have an effect when changing another user's password.

When **New User**, **Change Password**, or **Delete User** is selected, a command called "sudo" runs. This command temporarily modifies user permissions to execute privileged commands. When sudo runs, it verifies that the current user (the user account logged in) is configured as a sudo user privileged for the exact command sudo will execute. Sudo then asks for the current user's password.

*Note:* sudo "remembers" for several minutes that a password was successfully entered. Therefore, running additional commands from the Login Users window may not always result in a request for a password.

## Creating New Login Users

To create a new login user:

1. From the Security Editor window **Login Users** tab, click the **New User** button. The Create Login User informational window appears. This window display the message “Creating a new user in a separate window...”
2. The Create Login User text-entry window appears, running an interactive session “sudo adduser”.
3. Answer the questions in the text-entry window. The questions may vary slightly, depending on the version of program. The typical questions and the suggested answers are as follows:

| Question or Message                                                   | Action                                                                                                                                                                                                                                                                                                                                          |
|-----------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Please enter the password for (current user) (times out after 5 min): | Enter the password of the current user - <i>your</i> password. This account must have permission to modify users.                                                                                                                                                                                                                               |
| Login name for the new user:                                          | Choose a user name for the new user. This name must be unique to the system and be eight characters or less.                                                                                                                                                                                                                                    |
| Full name for (new user's name):                                      | Enter the new user's full name, such as John Doe.                                                                                                                                                                                                                                                                                               |
| The primary group for (new user's name) will be ics:                  | All MCC users should belong to the group ics. This message confirms that the new user has been automatically assigned to that group.<br><br><i>Note:</i> It is not <b>required</b> that the account of each MCC user has “ics” as its <b>primary</b> user group. However each user id must appear in the ics group for the user to run the MCC. |
| Another group that (new user's name) should be in. (<cr> when done):  | If this user will run the various commands in the Login Users section, type icsadmin and press the <b>Return</b> key to add it to the group.<br><br>Most users need not belong to any additional user groups. If so, press the <b>Return</b> key without entering a group name.                                                                 |
| Parent of the home directory for (new user's name):                   | Type the directory in which the user's home directory will be created, and press the <b>Return</b> key. Alternatively, just press the <b>Return</b> key to accept the displayed default.                                                                                                                                                        |

| Question or Message                                                                                                                                                                                                         | Action                                                                                                                                                                                                                                            |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Logname: (new user's name)<br>Fullname: (new user's full name)<br>Primary group: ics<br>Other groups: (group list)<br>Home directory: (new user's home dir)<br>Is this correct? [y]<br>User (user's name) has been created. | This summary allows you to confirm the entries. Enter <b>y</b> or <b>n</b> .<br>If <b>n</b> , you will start over with the previous answers as defaults.<br>If <b>y</b> , the new user is created.                                                |
| Please enter the password for (current user) (times out after 5 min):                                                                                                                                                       | This is your password. If you have entered it in the last 5 minutes, you will not be prompted for it again. You must have permission to create new users.                                                                                         |
| Changing password for (new user).<br>New password:                                                                                                                                                                          | Enter the initial password for the new user. When typing, the actual password is not displayed, so type carefully! Passwords must be 6 characters or longer, and contain at least one non-alphabetic character (a number or a special character). |
| Retype new password:                                                                                                                                                                                                        | Re-enter the password to verify.                                                                                                                                                                                                                  |
| Press RETURN when ready...                                                                                                                                                                                                  | The process is finished. Pressing the <b>Return</b> key causes the Console window to disappear.                                                                                                                                                   |

Table 28 Typical `sudo adduser` session

4. Click the **OK** button on the **Create Login User** window. A “Task Completed” message is displayed.

## Adding an Existing Unix User as a MCC User

Instead of creating a new login user for each MCC user (see *Creating New Login Users* on page 132), it is possible to add existing users who already have valid accounts in the OS as MCC users.

1. Log in as root.
2. Open the `/etc/group` file in vi or other editor. Add the name of the existing user to the ics group by putting “,username” at the end of the line starting with ics, for example, “,JohnD”. Save and close the file. For Linux systems, use appropriate administration to add the username to the ics group.
3. Log in to a MCC administrator’s account. Create a MCC user for the user name added in step 2. Refer to *Creating a new MCC User* on page 128 for details.
4. Add the user to the appropriate MCC security group(s). Refer to *Adding a MCC User to a Security Group* on page 129 for details.
5. If the user may run the MCC through gwcharcons, add the following to the end of the user’s `.profile` file:  

```
exec /usr/ics/bin/menu
```
6. The default `.xsession` for the new user is obtained from `/usr/ics/skel/.xsession`. Add items in `/usr/ics/skel/.xsession` to the end of the user’s `~/.xsession` file if the MCC is required to autostart when the user logs in.
7. If the user’s `.xsession` was edited in step 6, check the user can log into the MCC from an X session.

For assistance with the steps listed above, contact your OS system administrator.

## Changing a Login User's Password

To change a user's password:

1. From the Security Editor window **Login Users** tab, select the user in the **User** list box.
2. Click the **Change Password** button.
3. The Create Login User text-entry window appears, running an interactive session "sudo passwd <username>".
4. Answer the questions in the text-entry window. The questions may vary slightly, depending on the version of program. The typical questions and the suggested answers are as follows:

| Question                          | Action                                                                                                                                                                                                                                    |
|-----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Please enter your password:       | Enter the password of the current user - <i>your</i> password. This account must have permission to modify users.                                                                                                                         |
| Changing password for <new user>: | Enter the new password for the user. When typing, the actual password is not displayed, so type carefully! Passwords must be 6 characters or longer, and contain at least one non-alphabetic character (a number or a special character). |
| Retype new password:              | Re-enter the password to verify. The MCC ensures the same password was typed both times.                                                                                                                                                  |
| Press RETURN when ready...        | The process is finished. Pressing the <b>Return</b> key causes the Console window to disappear.                                                                                                                                           |

*Table 29 Typical sudo passwd <username> session*

5. Click the **OK** button on the Change Login User Password window.

## Deleting a Login User

To delete a user

1. From the Security Editor window **Login Users** tab, click the **Delete User** button.
2. The Delete Login User text-entry window appears, running an interactive session “sudo removeuser”.
3. Answer the questions in the text-entry window. The questions may vary slightly, depending on the version of program. The typical questions and the suggested answers are as follows:

*Note:* In the following procedure, press **Return** to select the default value when instructed. Default values are shown in square brackets.

| Question                                                                     | Action                                                                                                                                                                                                                                                                                       |
|------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Please enter the password for ics<br>(times out in 5 min):                   | Enter the password of the current user - <i>your</i> password, which is “ics” in this example. This account must have permission to modify users.                                                                                                                                            |
| Login name for the user to be removed:<br>[ johnd ]                          | Enter the login name of the user to remove, in this example “johnd”. This name should match the name as displayed in the list on the "Login Users" screen. The default is the user name selected in the Security Editor. Alternatively, just press <b>Return</b> with no name shown to exit. |
| Remove the user's home directory:[y]                                         | This message asks if the user's home directory should be removed. Select <b>y</b> (the default) to remove the directory and continue.                                                                                                                                                        |
| Logname: johnd<br>Remove johnd's home directory: yes<br>Is this correct? [y] | This message confirms the user and home directory to remove. Select <b>y</b> (the default) to remove the user and home directory.                                                                                                                                                            |
| Press RETURN when ready...                                                   | The process is finished. Pressing the <b>Return</b> key causes the Console window to disappear.                                                                                                                                                                                              |

Table 30 Typical removeuser session

4. Click the **OK** button on the **Delete User** window.

### Configuring login Groups

The sudo group MCCADMIN contains all users who are members of the login group called “icsadmin”. Login groups are configured in `/etc/group`. The MCC host’s `/etc/group` file should have a line similar to the following:

```
icsadmin:*:129:ics
```

This line defines a login group called “icsadmin”. It has a group ID of 129. In this example, the only user in the group is “ics”.

*Note:* Any other users who will run any of the commands from the Login Users screen must be listed on this line

*Creating New Login Users* on page 132 explains how to add a new user to the icsadmin group. However, to add an existing user to this group so that they are able to run the Login Users commands, this line in `/etc/group` must be edited by hand. Contact Visara Technical Support for assistance if necessary.

### Saving Changes in the Security Editor

To save changes in the security editor:

1. From the Security Editor window, click the **Save** button. A window appears asking for verification of the changes.
2. Click the **Save Changes** button.

Click the Go Back button to return to the Security Editor window without saving the changes.

The changes are made immediately for users logging in after the changes are saved. Users already logged in are not affected until the next time they login.



## Chapter 9 Managing and Editing Events with Event Manager

This chapter discusses how to modify event handling rules including:

- Console message event rules.
- SNMP trap event rules.
- Time event rules.

## Overview

The MCC Event Manager watches for user-configurable events to occur, performing a list of actions based upon the specific event. Event Manager is configured through the Event Editor, allowing the user to specify event rules and the actions to perform when a particular rule is triggered. Event Manager supports three types of event rules:

- Console Messages.
- SNMP Traps.
- Time Events.

The actions that can be performed in response to an event are:

- Log a message to the Filtered Message window.
- Generate an alert in the Alert window.
- Execute a script.
- Execute a host (OS) command on the MCC System (referred to as SYSEXEC).
- Ignore (no action).
- Key a command to a console.

## How Event Manager Works

When the MCC is started, the Event Manager:

- Begins scanning the printer queues for console messages.
- Asks SNMP Trap Manager to forward all traps to Event Manager.
- Begins checking scheduled rules against the current time and date.

When a new console message appears, Event Manager sequentially scans through the Console Message Rules looking for a match. The first match causes that rule's actions to be performed. No additional rules are searched; the first rule that matches is the only one that is triggered. Thus, event rule ordering is an important factor.

When a new SNMP trap arrives, Event Manager sequentially scans through the SNMP Trap Rules in a fashion similar to that for Console Messages.

When the current date and time match those specified in a Time Event, Event Manager sequentially scans through the Time Event Rules, executing those actions that are due.

For additional information, see *Console Message Rules* on page 143, *SNMP Trap Rules* on page 152, and *Time Event Rules* on page 153.

When changes are made to the event rules using the Event Editor, a configuration file is also changed. Event Manager normally only reads the configuration file at startup. However, when configuration changes are saved, Event Manager can be signaled to reprocess the event configuration file. Once told to reprocess the configuration, Event Manager attempts to reset itself. However, if there are pending actions to perform, Event Manager may not be able to immediately reset. In this case, after 2 seconds of delay, the attempt will fail and Event Editor brings up a screen indicating that Event Manager was too busy. If this occurs, the choices are:

- Attempt an immediate retry.
- Initiate periodic retry (with 15 seconds delay between attempts).
- Exit. In this case, Event Manager continues to use the old rules—the new rules take effect at next system start or the next time changes are made and saved, whichever occurs first.

## Editing Events

From the MCC Master Window, select the **Administration** menu—**Configuration:Event Editor** option. The Event Editor window appears.

*Note:* Access to this option requires that the user have “Configuration: Event Manager” security.

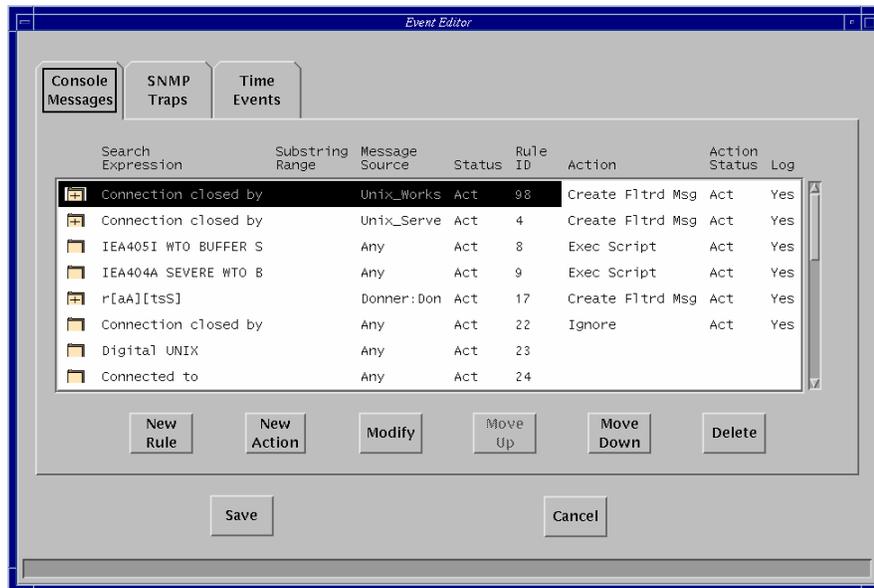


Figure 20 Event Editor, Console Messages tab

The Event Editor window displays events and the actions associated with those events. An event may have more than one action assigned to it.

The Event Editor window has three tabs:

- Console Messages.
- SNMP Traps.
- Time Events.

These tabs determine which rule type is configured. Within the work area is a list of the event rules of the selected type. To the right of each event is the first action to perform when the event rule is triggered. When opened, the folder icon displays any remaining actions if the event rule has multiple actions. The folder appears open or closed as appropriate, and a closed folder will have a plus sign (+) on it if there are additional actions to be viewed by opening the folder.

## Modifying Event Manager Rules

The following buttons are located on the Event Editor window:

- **New Rule.** Create a new event rule.
- **New Action.** Add a new action to the currently-selected event rule.
- **Modify.** Modify the currently-selected event rule or action.
- **Move Up / Move Down.** Move the currently-selected event rule or action up or down in the list.
- **Delete.** Delete the currently selected event rules or actions.

Double-clicking an event rule or action is equivalent to single-clicking and pressing the **Modify** button.

*Notes:* Event Manager processes rules in the order in which they appear in Event Editor. Only the first rule that matches the event being processed is used. Thus, more specific event rules must appear earlier in the list.

Actions are triggered in the order they appear, although they are not guaranteed to complete before the next action in the list is started.

Once changes are made, the **Save** button is enabled. Editing sessions can be canceled at any time. When changes are saved, Event Manager can be told to reread the configuration. Any changes do not take effect until the rule set is saved and reread when Save is selected or when the system is restarted.

### Common Rule Fields

To modify a rule, from the Master Console Center main window, select the **Administration** menu—**Configuration:Event Editor** option. From the Event Editor window, select an action from one of the tabs, then click the **Modify** button.

All event rules have these features in common:

- **Status.** How to treat the rule during processing:
  - *Act.* Active — perform the rule as normal.
  - *Sim.* Simulated — recognize the rule and log the actions to perform, but do not actually perform them. This option is mainly used for testing.
  - *Int.* Inactive — ignore the rule entirely. This option is mainly used for temporarily disabling a rule without completely deleting it.
- **Rule ID.** Assigned by the system when the rule is first created, the Rule ID helps to track events in Event Manager’s log file.

- **Comment.** This text area is for user notes. It can explain what the rule is trying to do, and may be especially useful if the search criteria are obscure or confusing. This is set from the Event Rule window.
- **Actions.** The list of actions to perform when the rule is triggered.

Refer to the sections describing the specific rule types later in this chapter for detailed information.

## Common Action Fields

To modify a rule action or rule event, from the MCC Master Window, select the **Administration** menu—**Configuration:Event Editor** option. From the Event Editor window, select one of the tabs and select an action or event to modify, then click the **Modify** button.

All actions have these fields in common:

- **Action.** This field indicates the type of action from the list of available actions to be performed.
- **Log Action.** Log actions are saved to the `/user/ics/log/event.log` file.
- **Status.** Active, Simulated, or Inactive. This is similar to the Status field for event rules.
  - **Active** means to perform the action normally.
  - **Simulated** means log the action, but do not actually perform it.
  - **Inactive** means to skip the action.
- **Split Words By.** This field is only available for actions associated with Console Message rules. When performing parameter substitution, a word from the input message can be specified. Normally, words are delimited by white space—tabs and spaces. However, alternate delimiters can be substituted.

## Additional Action Fields

In addition to the common action fields, the action selected from the **Action** drop-down list box on the Modify Rule Action window determines what additional fields appear on the Modify (action name) Rule Action window.

When the **Log Filtered Message** option is selected from the **Action** drop-down list box, the following options appear:

- **OS Name.** The name of the OS that should be associated with the message. This is required when the action is linked to an SNMP Trap. When this action is linked to a Console Message and this field is blank, the OS that originally generated the console message is used.
- **Message.** The actual text of the message. The message can include parameter substitution (see Table 31), as can the Message field for Create Alert.
- **Status.** The status number and color that this message should have in the filtered message window. This field should not be confused with the Action status.

When the **Create Alert** option is selected from the **Action** drop-down list box, the following options appear:

- **Message.** The actual text of the message. The message can include parameter substitution.
- **Status.** The status of the message in the alert window. This is similar to the status option for Log Filtered Message, and should not be confused with the Action status.

When the **EXEC SCRIPT** option is selected from the **Action** drop-down list box, the following options appear:

- **Script Name.** The name of the script to run.
- **Parameters.** This allows script parameters to be listed. Parameter substitution similar to that for Log Filtered Message and Create Alert can be made (see Table 31).
- **Class.** All scripts must be run on a particular class of object—Room, CPU, or OS. This field allows specification of the class. For Console Messages, “Same as Source” is a valid option; if selected, the source of the console message that triggered the event is used.
- **Icon Name.** Specifies the object on which to run the script—the Room, CPU, or OS.

When the **SysExec** option is selected from the **Action** drop-down list box, the following options appear:

- **Command.** The Unix command to run.
- **Korn Shell.** Normally, Unix commands should be run in a Korn shell. Running commands outside a Korn shell, however, can save system resources. When in doubt, run a command inside a Korn shell.

When the **KeyInput** option is selected from the **Action** drop-down list box, the following options appear:

- **Console Type.** Choose a console to which to key the input.
- **Sort By.** How the Console Name drop-down list box is sorted.
- **Console Name.** Selects a console.
- **Key String.** Used to build a parameter.

## Console Message Event Rules

Console message event rules are edited from the Console Message Rule window. From the Console Message Rule window, it is possible to add, modify, or delete console message rules. The **Move Up** and **Move Down** buttons allow rule order manipulation. The **OK** and **Cancel** buttons are used for saving and abandoning changes, respectively. Changes do not become permanent until **Save** is pressed in the main window.

From this window:

- Modify console message event rules.
- Modify console message rule actions.
- Build console message scripts.

## Modifying Console Message Event Rules

To modify console message event rules:

1. From the Event Manager window **Console Messages** tab, select an event rule.
2. Click the **Modify** button. The Console Message Rule window appears.

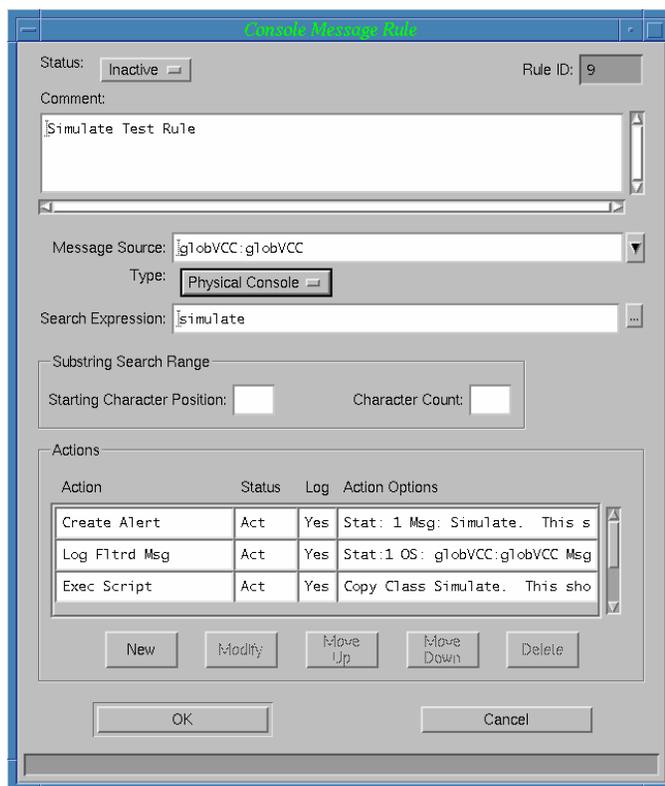


Figure 21 Console Message Rule window

In addition to the common rule fields (see *Common Rules Fields* on page 143), Console Message event rules have the following additional fields:

- **Message Source.** Console Messages come from OS and printer consoles. Valid sources are a specific OS, OS Groups, or any OS.
- **Type.** Selects whether the rule should match messages from a physical printer of the OS, the MVS Agent of the OS, or both. The default is to match on messages from the physical printer for the OS.
- **Search Expression.** The regular expression for which to search for. Refer to the *Scripting Guide* for details of regular expressions.
- **Start Position.** The column position of the search can be limited. If specified, Event Manager begins searching the input message at the specified character position.
- **Character Count.** The number characters in the input message for which to search, relative to the start position.

## Searching Console Message Rule Expressions

To search expressions:

1. From the Event Editor window **Console Messages** tab, select an event.
2. Click the **Modify** button. The Console Message Rule window appears.
3. Click the **Search Expression** build (...) button. The Search Expression Builder window appears.

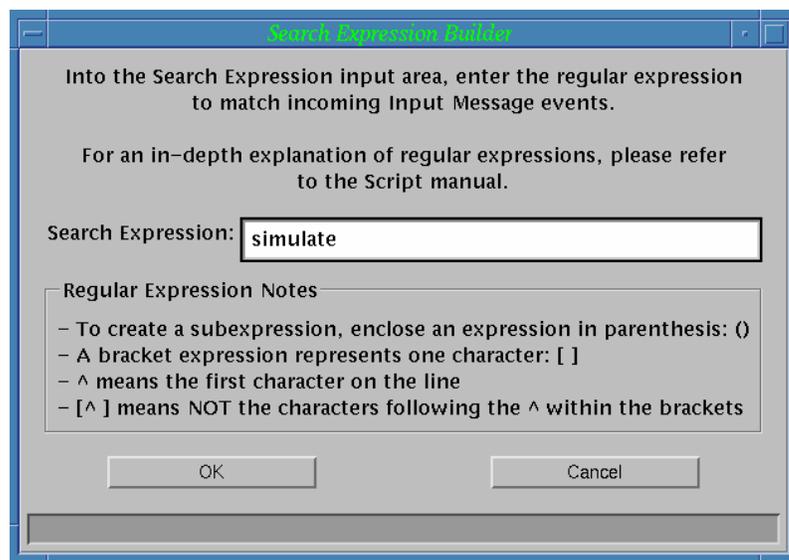


Figure 22 Search Expression Builder window

The Search Expression Builder window provides another entry point for editing the search expression.

### Regular Expressions

The search string used for processing console messages is a regular expression. Refer to the *Scripting Guide* for a discussion of regular expressions.

### Modifying Console Message Rule Actions

To modify console message rule actions:

1. From the Event Editor window **Console Messages** tab, select an event.
2. Click the **Modify** button. The Modify Console Message Rule Action window appears.

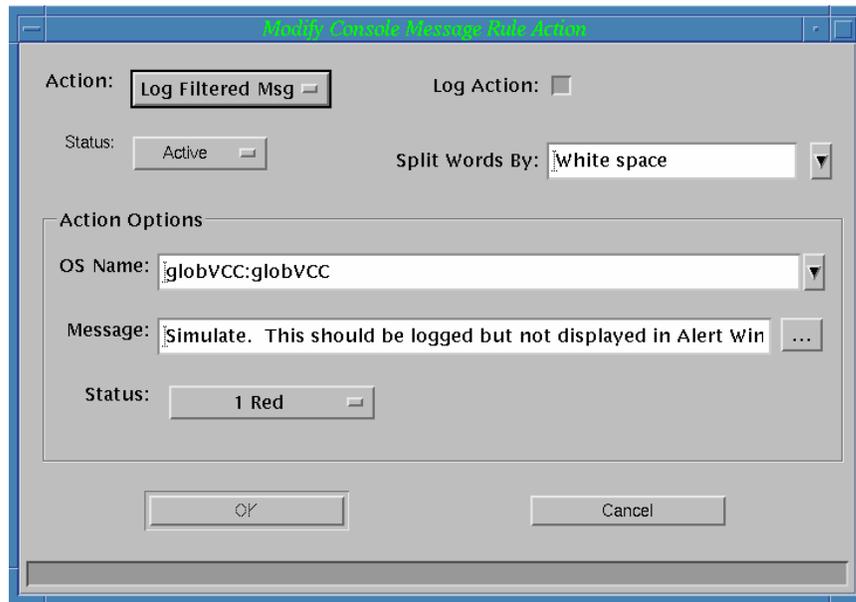


Figure 23 Modify Console Message Rule Action window

*Note:* This window changes based on the action type specified in the **Action** drop-down list box. See *Common Actions Fields* on page 144 and *Additional Action Fields* on page 145 for more information about this window.

## Building Console Message Parameters

When the **Exec Script** action option on the Modify Console Message Rule Action window is selected, a parameter may have to be set, depending on the script used.

To build time rule parameters:

1. From the Event Editor window **Console Message** tab, select an action.
2. Click the **Modify** button, or double-click an action. The Modify Console Message Rule Action window appears.
3. Click the **Parameters** build (...) button. The Build Parameters window appears.

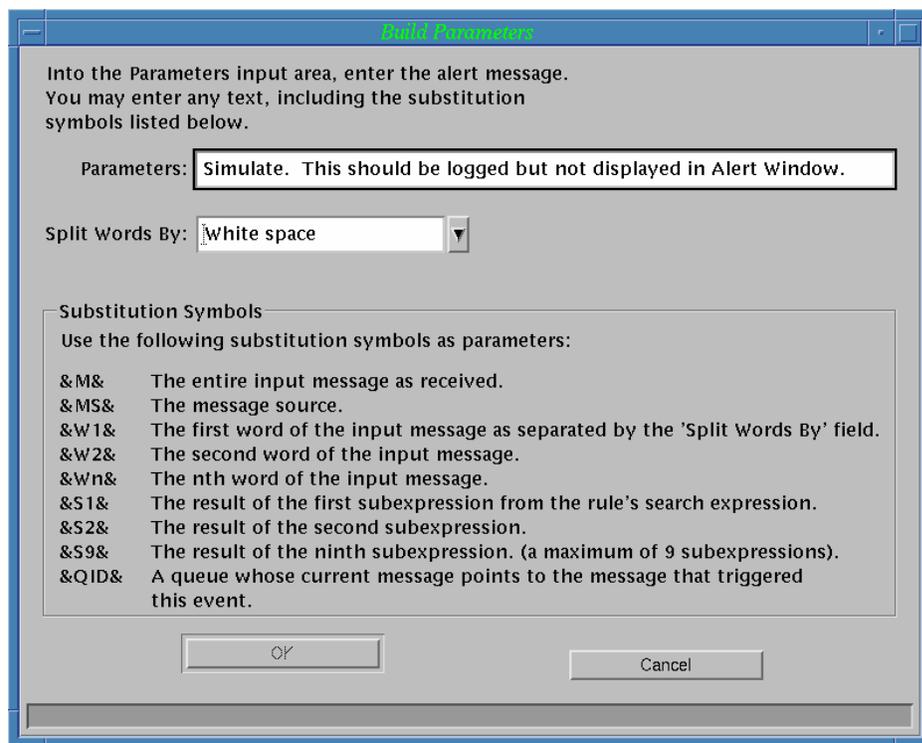


Figure 24 Console Message Build Parameters window

There are a number of action options that allow parameter substitution. For example, if the following Message option is specified for a Log Filtered Msg action from an OS named MyOS:

Input Source: &MS&

The following filtered message would result:

Input Source: MyOS

The Build Parameters window allows parameter substitution based upon the associated event rule type. For console messages, this window also allows modification of the “Split Words By” field.

The available substitutions for Console Message actions are listed in Table 31:

| <b>Substitution</b> | <b>Description</b>                                                                                                                                           |
|---------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
| &M&                 | The entire console message                                                                                                                                   |
| &MS&                | The message source (OS Name)                                                                                                                                 |
| &W1&                | The first word of the input message as separated by the “Split Words By” field.                                                                              |
| &W2&                | The second word of the message.                                                                                                                              |
| &Wn&                | Word number <i>n</i> . For instance, “&W1&” matches the first word in the console message. This substitution is affected by the Split Words By action field. |
| &S1&                | The first word of subexpression.                                                                                                                             |
| &S2&                | The second word of subexpression.                                                                                                                            |
| &S9&                | Results of the ninth expression.<br><i>Note:</i> A maximum of nine expressions are permitted.                                                                |
| &QID&               | Q queue reflecting the message that triggered the event.                                                                                                     |

*Table 31 Available Substitutions for Console Message Actions*

## SNMP Trap Event Rules

SNMP Trap event rules are modified or created from the Trap Event Editor window.

From this window, it is possible to:

- Modify SNMP trap events.
- Modify SNMP trap event actions.

### Modifying SNMP Trap Event Rules

To modify SNMP trap event rules:

1. From the Event Manager window **SNMP Traps** tab, select an event rule.
2. Click the **Modify** button. The SNMP Trap Rule window appears.

The screenshot shows the 'SNMP Trap Rule' configuration window. The 'Status' is set to 'Active' and the 'Rule ID' is 16. The 'Comment' field is empty. The 'Agent Name' is 'Any Agent', 'Generic Number' is 'Enterprise - 6', 'Enterprise OID' is '1.3.6.1.4.99', and 'Specific Number' is '3'. The 'Actions' section contains a table with columns for Action, Status, Log, and Action Options. Below the table are buttons for 'New', 'Modify', 'Move Up', 'Move Down', and 'Delete'. At the bottom are 'OK' and 'Cancel' buttons.

Figure 25 SNMP Trap Rule window

3. In addition to the common rule fields (see *Common Rule Fields* on page 143), SNMP Trap Event Rules have these parameters:

- **Agent Name.** As part of SNMP configuration, the agents with which the host communicates are specified. Groups of SNMP Agents can also be created. This field allows specification of an SNMP Agent or an SNMP Agent Group to associate with the rule. If neither an agent nor group is specified, the rule applies to all agents.
- **Generic Number.** Select a generic SNMP trap number from the drop-down list. If a trap number is not specified, the rule applies to any trap number.
- **Enterprise OID.** Specify an OID to send with the trap.
- **Enterprise Number.** One of the generic trap numbers is 6—Enterprise Trap. In this case, the trap has an additional important field—the enterprise trap number. If an enterprise number is not specified, the rule applies to any enterprise trap number.
- **Specific Number.** Identifies a specific trap. Several traps may have the same OID, but can be distinguished by the Specific Number.

### **Adding, Modifying or Deleting SNMP Trap Rule Actions**

From the **SNMP Trap** window, it is possible to add, modify, or delete SNMP trap rules associated with the trap. The **Move Up** and **Move Down** buttons allow rule order manipulation. The **OK** and **Cancel** buttons save and abandon changes, respectively. Changes do not become permanent until **Save** is selected from the main window.

To add a new SNMP trap rule action to the trap rule:

1. From the **SNMP Trap** window, click the **New** button. The New SNMP Trap Rule Action window appears (see *Figure 27*).
2. Define the entries in the Modify SNMP Trap Rule Action window as necessary, then click **OK**.

To modify an SNMP trap rule action:

1. From the **SNMP Trap** window, select an action.
2. Click the **Modify** button. The Modify SNMP Trap Rule Action window appears (see *Figure 28*).
3. Edit the entries in the Modify SNMP Trap Rule Action window as necessary, then click **OK**.

To delete an SNMP trap rule action:

1. From the **SNMP Trap** window, select an action.
2. Click **Delete**, and then click **OK** on the confirmation box.

### Creating or Modifying SNMP Trap Rule Actions

When the **New** or **Modify** button is selected on the SNMP Trap Rule window, the New/Modify SNMP Trap Rule Action window appears.

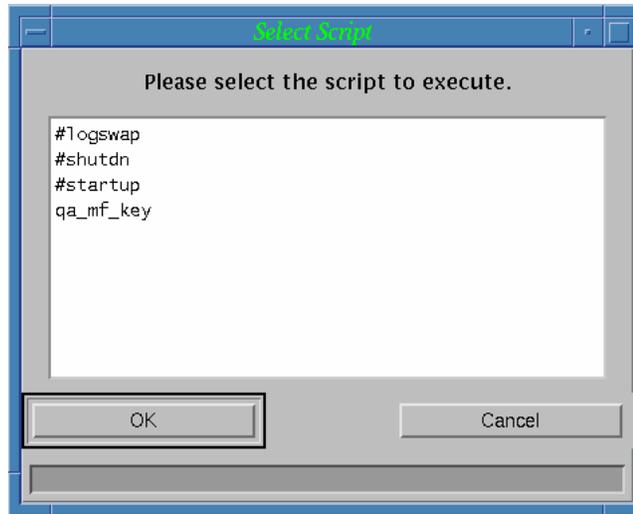
Figure 26 Modify SNMP Trap Action window

*Note:* See *Common Actions Fields* on page 144 and *Additional Action Fields* on page 145 for information about the Action and Status field selections.

3. Click the **Script Name** (...) button to select a script for this trap rule to run. See the *Selecting a Script for the Trap Rule to Execute* section following.
4. Click the **Parameters** (...) button to select parameters for this Trap rule. See the *Building SNMP Trap Rule Parameters* section following.

## Selecting a Script for the Trap Rule to Execute

When the **Script Name (...)** button is selected in the New/Modify SNMP Trap Rule Action window, the Select Script window appears.



*Figure 27 Select Script window*

To select a script for the trap rule to execute:

1. Select a script from the Script list box.
2. Click the **OK** button.

## Building SNMP Trap Action Rule Parameters

When the **Parameters (...)** button is selected in the New/Modify SNMP Trap Rule Action window, the Build Parameters window appears.

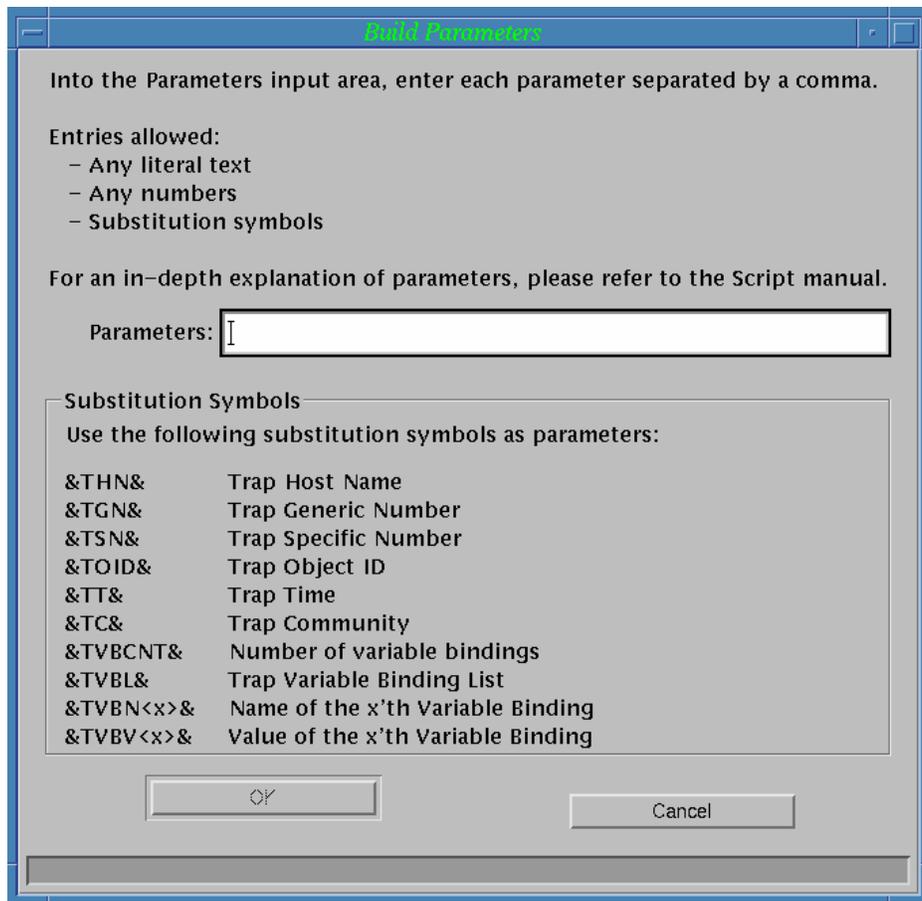


Figure 28 Build Parameters window

Enter the necessary parameters, including substitution symbols if appropriate, then click **OK**. The substitutions available for SNMP Traps are listed in Table 32:

| <b>Substitution</b>            | <b>Explanation</b>                                                                                                                                                                                                  |
|--------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>&amp;THN&amp;</b>           | Trap Host Name. Only used if the MCC System can resolve the hostname. If the IP address is not in the MCC /etc/hosts file, and the MCC is unable to determine the hostname through DNS, this value is null (empty). |
| <b>&amp;TGN&amp;</b>           | Trap generic number.                                                                                                                                                                                                |
| <b>&amp;TSN&amp;</b>           | Trap specific number                                                                                                                                                                                                |
| <b>&amp;TOID&amp;</b>          | Trap Object ID                                                                                                                                                                                                      |
| <b>&amp;TT&amp;</b>            | Trap Time / Duration                                                                                                                                                                                                |
| <b>&amp;TC&amp;</b>            | Trap community                                                                                                                                                                                                      |
| <b>&amp;TVBCNT&amp;</b>        | Number of variable bindings                                                                                                                                                                                         |
| <b>&amp;TVBL&amp;</b>          | Trap variable binding list                                                                                                                                                                                          |
| <b>&amp;TVBN&lt;X&gt;&amp;</b> | Name of the x <sup>th</sup> variable binding.                                                                                                                                                                       |
| <b>&amp;TVBV&lt;X&gt;&amp;</b> | Value of the x <sup>th</sup> variable binding.                                                                                                                                                                      |

*Table 32 Substitutions available for SNMP Traps*

## Time Event Rules

Time event rules are modified or created from the Time Event rule window.

From this window, it is possible to:

- Modify time events.
- Modify time event actions.

## Time Event Specification Requirements

To specify time events properly, follow these rules:

- The start time and end time, if entered, must be in a valid format according to a 24 hour clock. Midnight is entered as “00:00”, not “24:00”. If both start time and end time are entered, the end time must be later than the start time.
- Events that are run by a certain number of seconds, minutes, or hours cannot continue past midnight. This is because the start time on the next day might not match the next time the event is to be run, and the MCC system cannot resolve this ambiguity. For example, if an event is repeated every 5 hours starting at 3:00 A.M., it runs at 3:00 A.M., 8:00 A.M., 1:00 P.M., 6:00 P.M., and 11:00 P.M. The next time to run the event would either be at 3:00 A.M., because of the start time specified for the rule, or 4:00 A.M., which is five hours after the last run time. Therefore, the latest possible end time for an event is 11:59 P.M.
- The start date and end date, if entered, must be valid according to the locale’s date format.
- At least one day of the week must be selected to run an event. In addition, if an event is specified to run on a weekly basis, that particular day of the week must be selected. For example, if the start date is 7 February 2007 (a Wednesday) and the event will be run every two weeks, the checkbox for Wednesday must be selected.
- If an event is run every  $n$  days (where  $n$  is not a multiple of 7) or by any number of months, all days of the week must be selected. For example, if an event is started on a Monday and run every two days, it runs on Monday, Wednesday, Friday, then Sunday, Tuesday, Thursday, and Saturday of next week. All these days must be checked.
- If an event is being run on the 29<sup>th</sup>, 30<sup>th</sup>, or 31<sup>st</sup> of the month, that event will be run on the 1<sup>st</sup> of the next month in months that do not have those days. For example, if a start date of January 31 is specified along with a repeat interval of 1 month, the task runs on January 31, March 1, March 31, May 1, May 31, and so on.

**Examples**

- To run an event every Monday, Wednesday, and Friday during February, enter an appropriate start time and enter “02/01/2007” for the start date and “02/28/2007” for the end date (assuming the U.S. locale). Make sure only Monday, Wednesday, and Friday are selected, and all other days are cleared. It is not necessary to specify that the event will be run every  $n$  days.
- To run an event every 45 minutes from 8:00 A.M. until 5:00 P.M., enter “08:00” for the start time, “17:00” for the end time, “45” in the text box next to “Repeat every:”, and select “minutes” from the list next to it. It is not necessary to enter a start date or an end date; if they are not specified, the event runs every day.
- To run an event once on February 18 at 6:00 P.M., enter “18:00” for the start time, “02/18/2007” for the start date, and “02/18/2007” for the end date.

## Modifying Time Event Rules

Modify or create a time event rule from the Time Event Rule window.

To modify time event rules:

1. From the Event Manager window **Time Events** tab, select an event rule.
2. Click the **Modify** button. The Time Event Rule window appears.

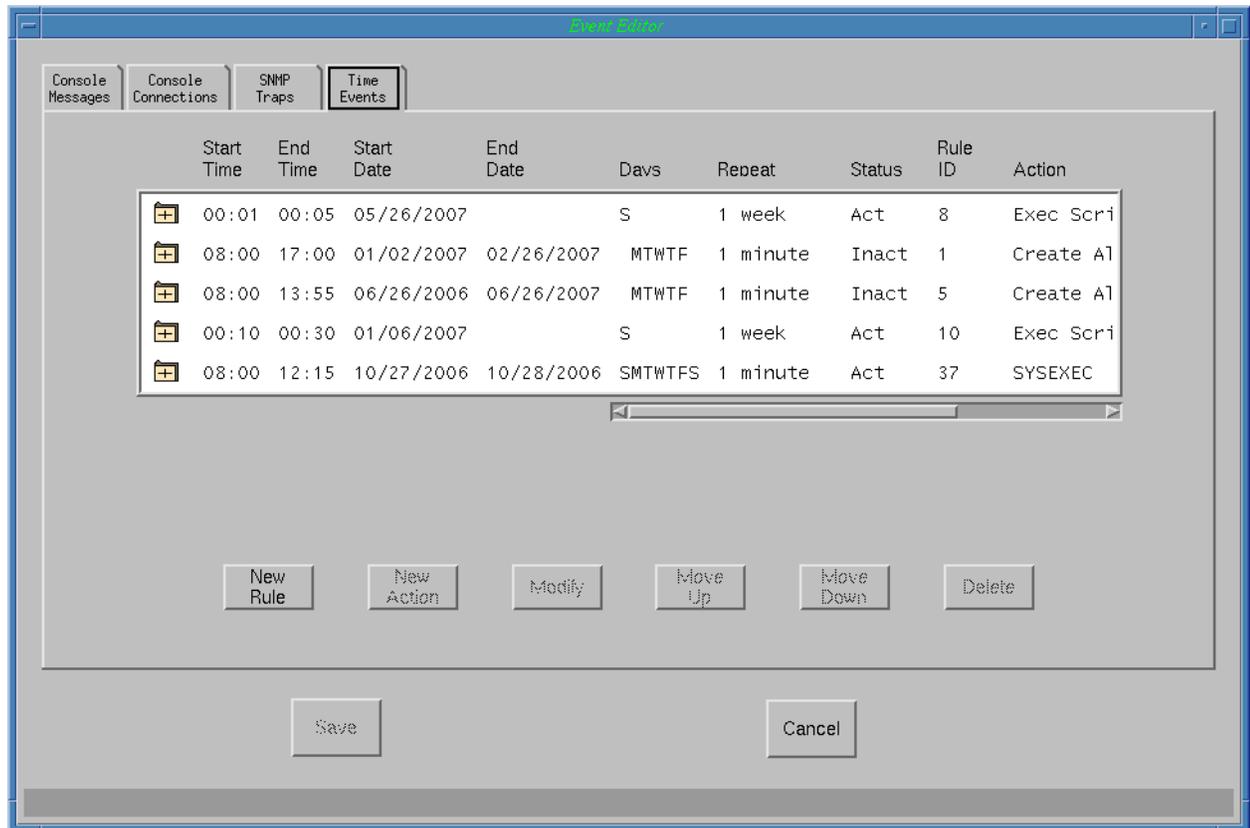


Figure 29 Time Event Rule window

In addition to the common rule fields (see *Common Rule Fields* on page 143), the Time Event Rule window displays the following information:

- **Start Time.** The first time of the day an event runs. This must be entered in 24-hour format: 9:15 A.M. is entered as 09:45, and 5:20 P.M. is entered as 17:20, and so on. This field is required for all events.
- **End Time.** The last time of the day an event runs. This is required if an event repeats at intervals of a specified number of seconds, minutes, or hours.
- **Start Date.** The first date on which an event is run, as a four-digit year in the locale's date format. For example, July 15<sup>th</sup> 2007 would be entered as "7/15/2007" in the United States, but as "15/7/2007" in the United Kingdom. This field is required if an event repeats at a specified number of days, weeks, or months.

- **End Date.** The last date on which an event is run. It is entered in the same format as the start date. This field is optional.
- **Run on days.** The day of the week is checked if an event runs on that day, or is not checked if the event does not run that day. At least one day of the week must be checked.
- **Repeat every.** Specify how often an event runs. The first text box specified the number of units, while the drop down list box to the right specifies the units in which to repeat it. The options for the repeat units are seconds, minutes, hours, days, weeks, or months. For example, to specify that an event runs every 45 minutes, enter “45” in the text box at the left and select “minutes” from the drop down list on the right.

### Creating a Time Event Rule Action

To create a new time event rule action for the current rule:

1. From the **Time Event Rule** window, click on **New**. The New/Modify Time Rule Action window appears (see *Figure 32*).
2. Define the entries in the Modify Time Rule Action window as necessary, then click **OK**.

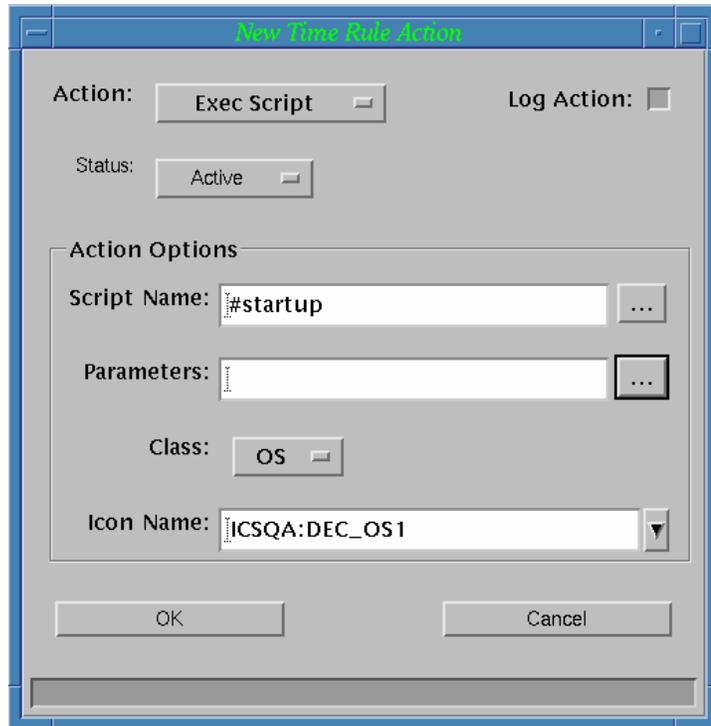
### Modifying a Time Event Rule Action

To modify a time event rule action for the current rule:

1. From the **Time Event Rule** window, select an action, then click on **Modify**. The New/Modify Time Rule Action window appears (see *Figure 32*).
2. Edit the entries in the Modify Time Rule Action window as necessary, then click **OK**.

## Creating or Modifying Time Event Rule Actions

When the **New** or **Modify** button is selected on the Time Event Rule window, the New/Modify Time Rule Action window appears, see *Figure 30*.



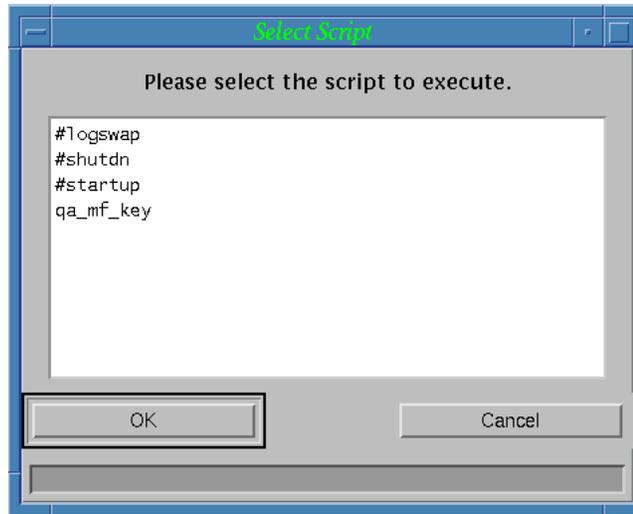
*Figure 30 New/Modify Time Rule Action window*

*Note:* See *Common Actions Fields* on page 144 and *Additional Action Fields* on page 145 for information about the Action and Status field selections.

3. Click the **Script Name** (...) button to select a script for this time rule to run. See the *Selecting a Script for the Time Rule to Execute* section following.
4. Click the **Parameters** (...) button to select parameters for this Time rule. See the *Building SNMP Trap Rule Parameters* section following.

## Selecting a Script for the Time Rule to Execute

When the **Script Name (...)** button is selected in the New/Modify Time Rule Action window, the Select Script window appears.

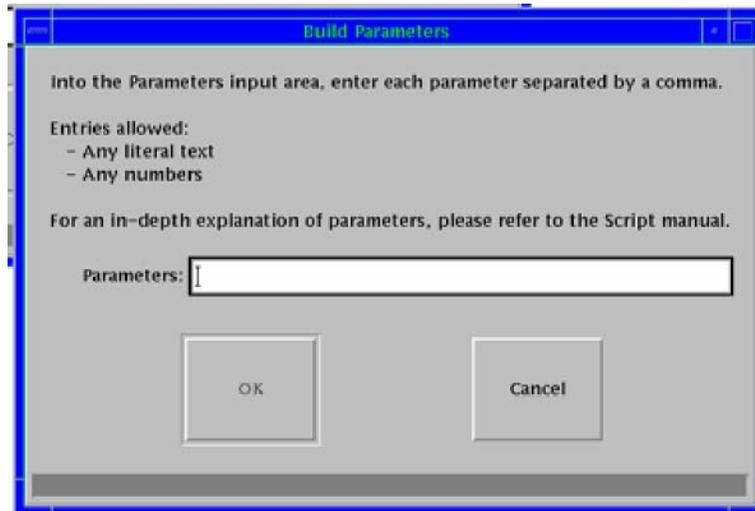


*Figure 31 Build Parameters window*

1. Select a script from the Script list box.
2. Click the **OK** button.

## Building Time Rule Action Parameters

When the **Parameters (...)** button is selected in the New/Modify Time Rule Action window, the Build Parameters window appears. Enter the necessary parameters, then click **OK**.



*Figure 32 Time Rule Action Build Parameters window*

No parameter substitutions are currently available for time events but you can build your own parameters.

There are no substitutions symbols available for timed events.

## Chapter 10 Maintaining Log Files

This chapter describes:

- The various log files that are created by the MCC.
- How to view each log.
- How to interpret the log entries.

## Overview

All messages are saved in log files, which fall into two categories:

- Output messages from the host systems.
- MCC messages, which are usually generated from scripts.

All log files are in standard ASCII format, and reside in the `/usr/ics/log` directory.

All logs can be accessed through the MCC GUI interface. All logs can be directly accessed through the Unix operating system.

*Note:* Exercise caution when directly manipulating these files to avoid data loss and corruption.

There are ten general MCC log files plus additional files for each optional console history log, as listed in Table 33:

| Active File Name              | Backup File Name                                                                                                                                                             | Description                                                    |
|-------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------|
| audit.log                     | audit.bak                                                                                                                                                                    | Audit messages for all consoles for which auditing is enabled. |
| channel.log                   | channel.bak                                                                                                                                                                  | Channel messages                                               |
| history/<Printer Name>/<date> | If more than one log file exists for the same console and day, additional files have .00001 (2 <sup>nd</sup> file), .00002 (3 <sup>rd</sup> file) etc. appended to the name. | Console history logs                                           |
| cpu.log                       | cpu.bak                                                                                                                                                                      | CPU messages                                                   |
| icsexec.log                   | icsexec.bak                                                                                                                                                                  | MCC execution messages                                         |
| icsmaster.log                 | <none>                                                                                                                                                                       | MCC startup, shutdown messages, and internal error messages.   |
| messages.log                  | messages.bak                                                                                                                                                                 | Filtered Message Window messages                               |
| newmsg.log                    | newmsg.bak                                                                                                                                                                   | Host messages not defined in the Event Manager.                |
| software.log                  | software.bak                                                                                                                                                                 | Software messages                                              |
| system.log                    | system.bak                                                                                                                                                                   | All attached hosts' incoming messages                          |
| unit.log                      | unit.bak                                                                                                                                                                     | I/O unit messages                                              |

Table 33 MCC Log Files

Channel.log, cpu.log, software.log and unit.log each have a maximum length of 500 messages.

icsexec.log, icsmaster.log, messages.log, newmsg.log, and system.log each have a maximum length of 10,000 messages.

When the active log file reaches the maximum length, the following actions occur:

1. The active log file is closed and renamed to the backup filename.
2. The system runs the Reserved Script *#logswap.scr*, passing parameters to it which describe the backup file. *#logswap.scr* can be modified to perform a specific action based on those parameters. Refer to the *Reserved Scripts* section of Chapter 1 of the Scripting Guide for more information.
3. A new active log file is created.

*Note:* *#logswap.scr* can allow backup logs to be kept indefinitely. If it is configured in this way, periodically check the logs and delete ones that are not needed to conserve disk space.

## Viewing Logs from the Unix Command Line

1. Start a Unix console.
2. Enter the following command:  

```
cd /usr/ics/log
```
3. To view additional screens, enter the following command to display the log file one screen at a time:

```
less <logfile name>
```

## Log File Descriptions

### alert.log: Alert Log

All actions performed with alerts are logged to alert.log. The format of the lines in the Alert Log files is:

```
date time user action AlertNum options
```

For example:

```
2007-01-14 14:31 arl New 131 New 4 Test message
2007-01-14 14:32 arl Mod 131 state Closed
2007-01-14 14:33 arl Del 131
```

These three lines indicate that user **arl** did the following at the specified times:

- Created a new alert, numbered 131. The initial state is new, status is new, and message is “Test message”.
- Modified this alert, changing its state to Closed.
- Deleted this alert.

The only actions defined are New (New Alert), Mod (Modification of existing Alert), and Del (Delete Alert).

Refer to *Chapter 2 of the Operations Guide* for information on modifying alerts.

## **audit.log: Audit Log**

The audit log records commands issued manually from the MCC console, and from MCC scripts. Outputs from all consoles for which auditing is enabled are combined in the same Audit Log. To activate this option, edit the system.cfg file and add a line to the console definition of each console to be audited containing

```
audit=yes
```

The audit log can be viewed only through the Unix command line.

The format of audit.log is as follows:

```
YYYYMMDD HHMMSS Console      User      keystrokes
```

Where YYYYMMDD=Year, Month, Date; HHMMSS=Hour, Minute, Second.

For example:

```
20070110 150838 MVS Console      oper      d t<Enter>
```

This line indicates that at 3:08:38 PM, on January 10<sup>th</sup> 2007, user “oper” issued the “d t” command on the MVS Console. The command was completed with an enter keystroke.

Keys that cannot be printed are displayed inside <>. Valid Codes appear in *Table 34 Table of Valid Key Codes* on page 170.

|                       |                     |                      |                     |
|-----------------------|---------------------|----------------------|---------------------|
| Alt_Clear             | Alt_CrSel           | Alt_A to _Z          | Alt_Backslash       |
| Alt_Backspace         | Alt_CentSign        | Alt_Comma            | Alt_DownArrow       |
| Alt_Enter             | Alt_EraseEOF        | Alt_Insert           | Alt_LeftBrace       |
| Alt_LessThan          | Alt_Period          | Alt_PF13             | Alt_PF16            |
| Alt_PF19              | Alt_Return          | Alt_Semicolon        | Alt_ShiftLock       |
| Alt_SingleQuote       | Alt_Slash           | Alt_Space            | Alt_Tab             |
| Alt_UpArrow           | AltCursor           | AltGrave             | AsgnCons            |
| Attn                  | Backslash           | Backspace            | BackTab             |
| Bkwd                  | Break               | BrokenPipe           | Cancel              |
| CentSign              | ChangeDisplay       | Clear                | Cmd                 |
| CommReq               | Control_A to _Z     | Control_Null         | Copy                |
| CrSel                 | CursrBlink          | Delete               | DevCancel           |
| Diag                  | DMsgBkwd            | DMsgFwd              | DoubleLeft          |
| DoubleRight           | DownArrow           | Dup                  | End                 |
| Enter                 | EraseEOF            | EraseInput           | Escape              |
| ExSel                 | ExtColorBlue        | ExtColorGreen        | ExtColorInherit     |
| ExtColorPink          | ExtColorRed         | ExtColorTurquoise    | ExtColorWhite       |
| ExtColorYellow        | ExtHighlightBlink   | ExtHighlightInherit  | ExtHighlightInverse |
| ExtHighlightUnderline | FileSeparator       | FldMark              | Frwd                |
| GroupSeparator        | Home                | Ident                | Index               |
| Insert                | Intr                | Irpt                 | IStep               |
| Keyclick              | LastCmd             | Left                 | LeftArrow           |
| LeftBrace             | LineDisc            | ModeSel              | Msg                 |
| NotSign               | NotSign             | Null                 | PA1                 |
| PA2                   | PageDown            | PageUp               | Pause               |
| PF1 to PF24           | Play                | Print                | ProgSymbolA         |
| ProgSymbolB           | ProgSymbolC         | ProgSymbolD          | ProgSymbolE         |
| ProgSymbolF           | ProgSymbolInherit   | Record               | RecordSeparator     |
| Refresh               | Req                 | Reset                | Restart             |
| Return                | Right               | RightArrow           | RightBrace          |
| RightBracket          | SolidPipe           | SPMO                 | Start               |
| Stop                  | SvPCE               | SwapCons             | SysReq              |
| Tab                   | Test                | Tilde                | TOD                 |
| Underscore            | UnitSeparator       | UpArrow              | ViewLog             |
| VT100_App_DownArrow   | VT100_App_LeftArrow | VT100_App_RightArrow | VT100_App_UpArrow   |
| VT100_KP_0 to _9      | VT100_KP_Add        | VT100_KP_Decimal     | VT100_KP_Divide     |
| VT100_KP_Enter        | VT100_KP_F1         | VT100_KP_F2          | VT100_KP_F3         |
| VT100_KP_F4           | VT100_KP_Multiply   | VT100_KP_Subtract    |                     |

Table 34 Table of Valid Key Codes

## channel.log: Channel Log

The channel log contains channel messages. The channel log cannot be deactivated and is populated by scripts. To direct a message into the channel log, use the LOG script command:

```
LOG(LOG_CHAN, $Msg)
```

The channel log can be viewed only through the Unix command line.

When channel colors are manually changed with the Icon command of the MCC, a message can be entered which is recorded to this log.

The format of channel.log is as follows:

```
CYYYYMMDD      HHMM Scriptname  Message
```

Where C=Color/Status; YYYYYMMDD=Year, Month, Date; HHMM=Hour, Minute.

For example:

```
420071204      0829 #dilost      D/I BOX LOST.  
420071204      0829 #dolost      D/O BOX LOST.
```

This indicates that on December 4<sup>th</sup> 2007 at 8:29 AM, the #dilost script logged the message “D/I BOX LOST” in the channel log. At the same time, the #dolost script logged the message “D/O BOX LOST” into the channel.log. Both messages were logged as Status Number 4.

## Console History Log

The MCC maintains Console History Logs that contain recent event messages for selected consoles.

- The console history logger program starts each time the MCC is started or restarted. At startup, it begins reading the MCC message queue for messages directed to consoles that have history logging configured. Each such message is copied to the history log file for the particular console.
- At the start of each day, the console history logger starts a new log file for each console. At the same time, it purges any log files that are older than the number of days specified in the system.cfg file.
- For each such console, one log file is created each day. The file name includes the name of the console to aid identification. However, each time the current log file exceeds 10 MB, a new file is created. Consequently, several log files may exist for the same console and the same day.
- When viewing console history, all messages are displayed in one viewer, unless the information for all logs for the console exceeds 10MB. If this limit is exceeded, each file is displayed in its own window and the PREV and NEXT options can be used to navigate between the logs.
- Console history logs are maintained for consoles that are defined as printer consoles – this is how messages are placed in the message queue. For mainframe consoles, logs are maintained for printer consoles only. For non-mainframe consoles, such as telnet or RS232, logs are maintained for printers defined in the OS definition with the “printer=” key. In each case, the number of days history to retain must be defined in the system.cfg file, as shown in the following examples. If this entry is omitted or days\_history=0, no console history log is kept for the console. The messages in the Console History Log files are copied from the MCC message queue. When a user views the console history log, the messages are displayed in the normal format for the console, with a time and date stamp inserted at the beginning of each message.

*Note:* If upgrading from a previous MCC release, console history log files are renamed to include the console name. For example, a file called /usr/ics/log/history/zeus/2007-07-16.0001 is renamed /usr/ics/log/history/zeus/zeus 2007-07-16.0001.

### **Viewing New Console History Messages as Received**

New console history messages are added to the bottom of the history log file as they are received. If the cursor is located on the bottom line of the log, the new messages can be viewed as they occur. The cursor remains “locked” in the same position, regardless of how many messages are received. To move the cursor to the bottom of the log, use the Motif shortcut keys <Ctrl>+End, or the Page Up, Page Down, or arrow keys. It is also possible to scroll to the end of the log, then click the mouse to place the cursor on the last line.

*Note:* Take care when using the scroll bar to navigate through the log, as the cursor remains where it was last placed. If the cursor is on the last line, when a message is received while viewing the middle of the log, the display jumps immediately to the bottom of the log to show the new data.

**Viewing the History Log from a Console Window**

If a history file is maintained for the displayed console, it can be viewed by selecting the **Console History** option from the **Window** menu of the Console window. If the message data is less than 10MB, all of the available history is displayed, otherwise the most recent information is shown. If there is more than 10MB of message data, use the **Next File** and **Previous File** buttons to view messages in history logs adjacent to the file that is currently displayed. These buttons are disabled if there is less than 10MB of data.

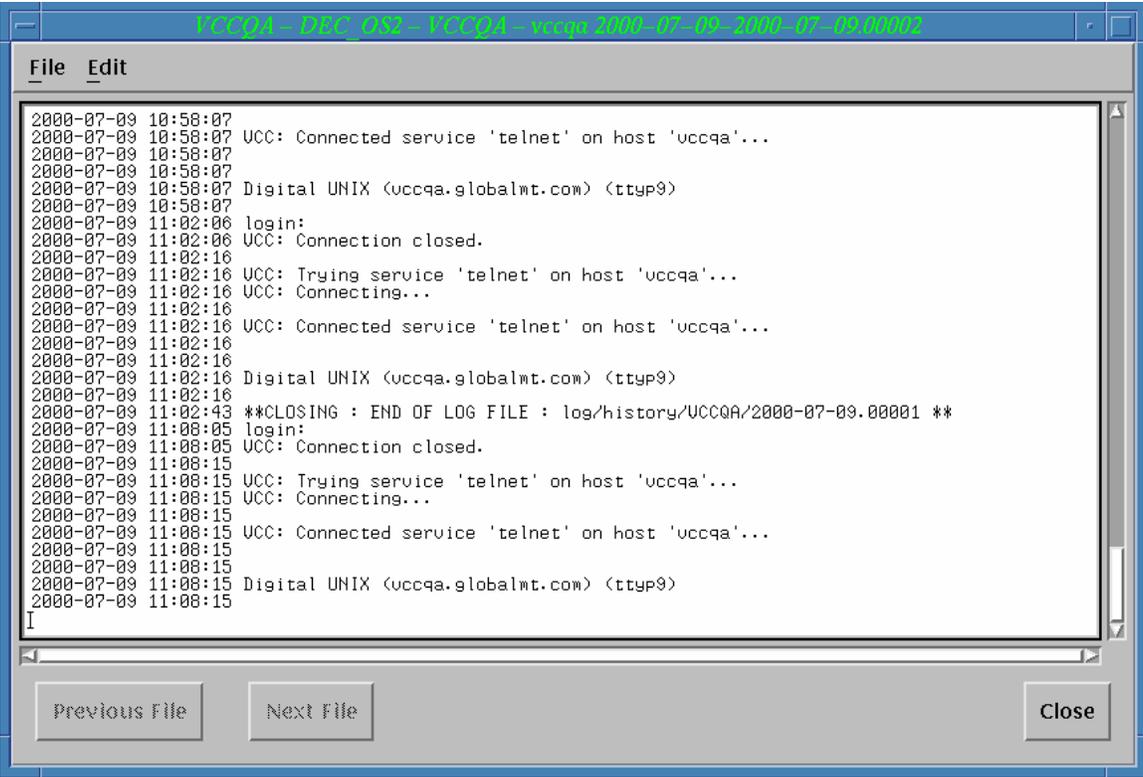


Figure 33 Typical History Log from Console Window

**Viewing the History Log from a GWCC (gwcharcons) Console**

If a history file is maintained for the displayed console, it can be viewed by typing the Ctrl-O command. The program “more” is used to display the messages. If the data in the history file is less than 10MB, all of the available history is displayed, otherwise the most recent information is shown. If the data in the history log exceeds 10MB, use the “more” program commands Next (:n) and Previous (:p) to scroll through the messages.

### **Sample Console History Log Configuration**

The following sample configuration shows the entries required to define an OS with an telnet console and a printer, then enable console history logging for the printer only. Refer to Chapter 5 MCC system.cfg Configuration File for more details of where to make these entries.

```
[os mccdebug0]
type=unix
console=mccdebugC
printer=MCCdebug printer

[console mccdebugC]
interface=telnet
host=mccdebug
iotype=vt100

lock_timeout=5

[printer mccdebug printer]
interface=telnet
host=mccdebug
iotype=vt100

days_history=10
```

## Troubleshooting Problems with Console History Logging

The console history log is not displayed if no console history is being maintained for the associated printer. If console history is unavailable, check the following:

- Run the configuration checker (see *CFGCHK Program* on page 210). The checker displays warnings if Days History is specified inconsistently or incorrectly, or if the printer is not referenced.
- Check the historylogger.log file for messages indicating why the history logger is ignoring the relevant printer. Printers are ignored if Days History is omitted or is 0 days. Printers are ignored if no OS refers to the printer.
- Consoles are associated with printers through an OS. There must be an OS configured that refers to both the console and the printer associated with it.

## cpu.log: CPU Log

The CPU log is populated by scripts using the LOG command:

```
LOG(LOG_CPU, $Msg)
```

The CPU log can be viewed only through the Unix command line.

When CPU colors are manually changed with the Icon command of the MCC, a message can be entered which is recorded to this log.

The format of cpu.log is as follows:

```
CYYYYMMDD HHMM [Operator Initials or Script Name] Message
```

Where C=Color/Status; YYYYYMMDD=Year, Month, Date; HHMM=Hour, Minute.

For example:

```
220061212      1349  JDA    GX8 has lost communications.
```

## event.log: Event Log

Event Manager logs its activities into the event.log file. All lines in event.log begin with a date and time stamp. At startup, Event Manager issues a “--- gwEventMgrD Startup ---” message (with more dashes than shown here). After that, format of the lines is as follows:

```
YYYY-MM-DD HH:MM:SS eventSeq eventStatus eventType ruleID eventDesc
YYYY-MM-DD HH:MM:SS eventSeq actStatus actType actDesc
```

Where:

- **YYYY** is the four-digit year with Month (MM) and Date (DD) following, and the time is in Hour:Minute:Second format. Time is recorded in 24-hour format.
- **eventSeq** is the Event Sequence Number associated with a rule and its actions. Each rule has a unique Event Sequence Number, and all of the actions associated with that rule use the same Event Sequence Number.
- **eventStatus** is one of three values: ACTIVE, SIMULATED, or INACTIVE.
- **eventType** will also be one of three values: Console Msg Event, SNMP Trap Event, or Time Event.
- **ruleID** is the internal identification number that the MCC system uses to identify the rule. The ruleID is visible in the Event Editor.
- **eventDesc** is a description of the event. For example, if an event rule scans for the phrase “Connection closed,” eventDesc contains the full text of the triggering event. Thus, both “Connection closed.” and “Connection Closed by foreign host.” activate the same event rule, but each event.log entry has different eventDesc values.
- **actStatus** is the status of the action. It has one of three values: ACTIVE, SIMULATED or INACTIVE.
- **actType** is the type of the action performed. It can be one of five values: Create Fltrd Msg Action, Create Alert Action, SYSEXEC Action, Exec Script Action, or Ignore Action.
- **actDesc** is a full description of the action performed. For Ignore Action actTypes, this is blank. For Create Fltrd Msg Action & Create Alert Action, this contains the full text of the alert or filtered message, but no other data. For the SYSEXEC Action, this lists the exact text of the command executed on the MCC system. For the Exec Script Action, this is blank.

Each triggered event generates one message of the first type. Each action associated with the event generates a message of the second type, if the action has “Log” set.

*Note:* Events are logged in the order of initiation. However, it is possible that the first action associated with a rule may appear in the log *after* the entry for the second action associated with that rule. This indicates that the first action did not fully begin before the second action.

Here are some sample Event Log entries:

```
2006-12-20 15:16:16 2 ACTIVE Console Msg Event 5 - AIX - alpha1
2006-12-20 15:16:16 2 ACTIVE Ignore Action
2006-12-20 15:16:16 1 ACTIVE Ignore Action
2006-12-20 15:17:00 3 ACTIVE Console Msg Event 2 - AIX - $ echo alpha3
2006-12-20 15:17:00 3 ACTIVE System Cmnd Execute Action - mv /tmp/ar11 /tmp/ar12
2006-12-20 15:17:00 4 ACTIVE Console Msg Event 2 - AIX - alpha3
2006-12-20 15:17:01 4 ACTIVE System Cmnd Execute Action - mv /tmp/ar11 /tmp/ar12
2006-12-20 15:17:00 3 ACTIVE Alert Generate Action - AIX $ echo alpha3
2006-12-20 15:17:01 4 ACTIVE Alert Generate Action - AIX alpha3
```

The first line describes the triggering of event rule 5 -- a Console Message event from OS AIX. Line two is the only action for rule 5 -- an Ignore. Line 3 is the continuation of a previous event (identifiable by its Event Sequence number of 1) -- another Ignore action. The full activities of events 3 and 4 (both Console Message rule # 2) are displayed.

## icsexec.log: MCC Execution Log

The MCC execution log contains all the messages automatically generated by the MCC programs, both error messages and normal informational messages. When the MCC automatically executes a script based on a condition, the details are recorded here. The Execution Log can also be the target of a LOG statement:

```
LOG(LOG_EXEC, $Msg, %Status)
```

The MCC Execution Log can be viewed through the Unix command line, or through the Execution Log Display window of the MCC GUI.

The format of icsexec.log is as follows:

```
CYYYYMMDD      HHMM [MsgID or script name] Message
```

Where C=Color/Status; YYYYYMMDD=Year, Month, Date; HHMM=Hour, Minute.

For example:

```
220061129      1143 PWR102I Power box monitor ended.
220061129      1143 CFG102I Configuration manager ended.
920061129      1948 MSW102I ics: Master window ended.
```

In this example, at 11:43 AM on November 29<sup>th</sup> 2006, the Power box monitor and Configuration manager processes ended. Both messages were sent to the Execution Log Window, and displayed as Status Number 2. At 7:48 PM on the same day, user ics logged out, generating the message concerning Master Window ending. This message had a Status Number of 9 (STATUS\_NORMAL, or pale green).

*Note:* Whenever a user logs in or out, the resultant startup and or logout messages are recorded in the Execution Log, preceded by the UserId.

## **icsmaster\_YYYY-MM-DD: MCC Startup and Shutdown Error Log**

Whenever the MCC system is shut down or started up, error messages are recorded in this log file. The MCC reroutes stderr messages from all programs to icsmaster\_YYYY-MM-DD, adding color/status and date/time to the beginning of some messages. This file cannot be the target of a LOG command. It can only be viewed through the OS command line.

## **messages.log: Filtered Message Log**

The Filtered Message log contains all the filtered messages from all hosts attached to the MCC. It cannot be turned off, but can be the target of a LOG statement:

```
LOG(LOG_FLT, $Msg)
```

The filtered message log can be viewed through the Unix command line, or through the Filtered Messages window of the MCC GUI.

The format of the messages.log file is:

```
CYYYYMMDD HHMM [OS or script name]          message
```

Where C=Color/Status; YYYYYMMDD=Year, Month, Date; HHMM=Hour, Minute.

For example:

```
120070109 1848 Prod1          JES2 Stopped
```

The status in this message is the leading 1. On January 9<sup>th</sup> 2007 at 6:48 PM, the Prod1 OS issued the message “JES2 Stopped.”

## **newmsg.log: New Messages Log**

When Event Manager is processing console messages and a console message does not match any rule in the list of event rules, the message is written to the New Messages Log, `newmsg.log`. This log can identify new messages to handle with automation scripts.

Where possible, this log should be empty—no new messages should be logged here. Check this file every one or two weeks, and note any new messages the MCC has received. It may be advisable to check this log more frequently in the period after initial installation.

To stop a message being logged here, add a rule for it in the Event Manager. For the messages that are unimportant or are not to be logged to the Filtered Message Window, code the rule with an action of “ignore”, or with no action at all. Refer to *Chapter 9 Managing and Editing Events with Event Manager* for more information on creating rules and actions.

To view the `newmsg.log`, select the Administration—Logs—New Messages option from the Master Window.

The format of the `newmsg.log` is as follows.

The format of this file is:

```
OS Message
```

For instance:

```
Solaris Login:  
AIX $ ls
```

The OS name is right-justified in an 8-character field, and has been bolded here for clarity. If the OS name exceeds eight characters, the message text is offset so that the complete OS name is printed.

**software.log: Software Messages Log**

The Software Messages Log contains only those messages that have been explicitly logged with this syntax:

```
LOG(LOG_SW, $Msg)
```

This log may be populated by scripts.

When OS colors are manually changed with the Icon command of the MCC, a message can be entered which is recorded to this log.

The format of the logged data is:

```
CYYYYMMDD HHMM [Operator Initials or script name] message
```

Where C=Color/Status; YYYYYMMDD=Year, Month, Date; HHMM=Hour, Minute.

For example:

```
420061212 1351 JDA Prod1 restored to normal colors.
```

## **system.log: Host System Messages Log**

The Host System Log contains the raw, unprocessed text of all printer messages received by the MCC from host systems. It can be viewed from the Unix command line, or by selecting the Other—System Messages Log menu option.

The format is:

```
2OS      Text      ContFlag
```

The first character in the line will always be a 2. This is followed by the OS Name and the message text. Appended to the end of the line is the continuation flag -- a 0 or 1. Each line has a fixed length of 162 characters. An example with most of the spaces between the text and continuation flag is:

```
2PROD1  0E25 CTC OFFLINE  1
2PROD1  0E26 CTC OFFLINE  0
```

The continuation flag indicates whether the next message is part of the same burst of traffic from the mainframe. The response to a particular console message may result in numerous lines of output, with continuation flag of 1 occurring more than once; however, the last line of response to the command will always have a continuation flag of 0.

## **unit.log: I/O Unit Messages Log**

The Unit Messages log is populated by scripts. It can be updated through the MCC GUI's Icon command or through a LOG command:

```
LOG(LOG_IO, $Msg)
```

It can only be viewed through the OS command line.



## **Chapter 11 Backing Up and Restoring MCC Software**

This chapter discusses how to back up and restore MCC files and scripts.

## Overview

It is important to backup the MCC, particularly custom scripts, to safeguard against unexpected problems. To ease the task of creating backups, MCC scripts are provided for automatically copying the files to tape.

|                | <b>Full</b>                          | <b>MCC System</b> | <b>Scripts Only</b> |
|----------------|--------------------------------------|-------------------|---------------------|
| <b>Backup</b>  | fullbackup                           | MCCbackup         | scriptbackup        |
| <b>Restore</b> | See <i>Full Restore</i> on page 187. | MCCrestore        | scriptrestore       |

*Table 35 Backup and Restoration Scripts*

## Backing Up Files

To backup files:

1. Insert a tape into the MCC tape drive.
2. Execute the appropriate script:
  - To backup the entire file system, select `/usr/ics/bin/fullbackup`. Run this script as root.
  - To backup all MCC files, including configuration and script files, select `/usr/ics/bin/MCCbackup`.
  - To backup only MCC scripts, select `/usr/ics/bin/scriptbackup`.
3. Remove the tape, label it, and store it in a safe place.

*Note:* The tape includes a date stamp and a dump of the disklabel. The files are `/usr/tmp/date` and `/usr/tmp/disk`. They are included in the tar file at the beginning of the tape.

## Restoring Scripts

**Caution:** Do NOT try to run `scriptrestore` except on a tape generated by `scriptbackup`. Also, do NOT attempt to do a `MCCrestore` except on a tape generated by `MCCbackup`. Data loss or corruption may result.

### Full Restore

This procedure assumes the MCC has a fully installed operating system with correctly partitioned files.

1. Login as root.
2. Enter the following commands to replace the root partition with the backup files:  

```
#mt -f /dev/nrmt0h fsf
# cd /
# restore -Yrv
```
3. Enter the following commands to move the tape to the third section on the tape where the `/usr` partition resides.  

```
# mt -f /dev/nrmt0h fsf 2
# cd /usr
```
4. Enter the following command to replace the `/usr` partition with the backup files.  

```
# restore -Yrv
```
5. Enter the following command to reboot the system and restore the MCC.  

```
# sync; sync; shutdown -rf now
```

## Restoring Other Files

1. Insert the appropriate tape into the MCC tape drive.
2. Execute the appropriate script:
  - To restore ALL MCC files, including binaries, configuration, and script files, select `/usr/ics/bin/MCCrestore`. This restores the files to the CURRENT directory. VISARA recommends restoring files to `/tmp` or `/usr/tmp`, and then copying the relevant files to the proper subdirectory under `/usr/ics`.
  - To restore only MCC scripts, select `/usr/ics/bin/scriptrestore`. This restores the files to the CURRENT directory. VISARA recommends restoring files to `/tmp` or `/usr/tmp`, and then copying the relevant files to the proper subdirectory under `/usr/ics`.

## Chapter 12 Setting MCC System Date and Time

This chapter describes how to adjust the MCC's date and time when necessary. A procedure is also given for selecting the correct time zone.

## Setting Date and Time

Occasionally, it may be necessary to reset the MCC system date and/or time. Unix handles both daylight savings time and leap years by automatically changing the time or date, so normally no manual time adjustments are required.

*Note:* Changing the year requires additional steps. If the year needs to be changed, consult the Unix man pages on the date command.

To change the date or time:

1. Enter single user mode by shutting down the system and, at the ">>>" prompt, entering "boot -s".

2. On the MCC system console, log in with user id "root".

3. Enter the date command:

```
date mmddhhnn
```

where mm=month, dd=day, hh=hour, and nn=minutes

4. When the prompt returns, verify the date/time is correct by repeating the date command with no values after it:

```
date
```

5. Logout by typing

```
exit.
```

## Changing the Time Zone

To change the time zone information, perform the following steps:

1. On the MCC system console, log in with user id “root”.
2. Change to the `/etc/zoneinfo` directory:
3. Use the following command to list and browse through all time zone files:

```
cd /etc/zoneinfo
```

```
ls | more
```

4. Pick the appropriate time zone and write down the file name. For example, in the US subdirectory, Mountain is the file name of the timezone for the US Mountain area.

```
rm localtime  
ln -s ./<appropriatezonefile> ./localtime  
(e.g. ln -s ./US/Mountain ./localtime)
```



## Chapter 13 Printing from the MCC

This chapter describes how to configure a printer for use with the MCC. It does NOT describe how to use printer consoles through the MCC.

## Overview

The ability to print files directly from the MCC may prove useful in some situations. Configuring the printer (NOT to be confused with printer consoles) is relatively straightforward. The MCC can print to an LP/LPD capable printer, or to a printer host which has been configured to accept print requests from other machines.

## Configuring Printing

To configure the MCC for TCP/IP network printing:

1. Define the print host in `/etc/hosts` or DNS.
2. Ping the print host by name to verify name resolution and print host availability.
3. Log in as root and execute the following steps. Enter the text in bold and verify the responses are as shown. **<cr>** means press the Enter key.

```
# ping -c2 laserjet5
PING laserjet5.visara.com (204.220.32.90): 56 data bytes
64 bytes from 204.220.32.90: icmp_seq=0 ttl=60 time=4 ms
64 bytes from 204.220.32.90: icmp_seq=1 ttl=60 time=3 ms

----laserjet5.visara.com PING Statistics----
2 packets transmitted, 2 packets received, 0% packet loss
round-trip (ms) min/avg/max = 3/3/4 ms
# /usr/sbin/lprsetup

Digital UNIX Printer Setup Program

Command < add modify delete exit view quit help >: a

Adding printer entry, type '?' for help.

Enter printer name to add [0] : <cr>

For more information on the specific printer types
Enter `printer?'

Enter the FULL name of one of the following printer types:

cp382d    dl1152w    dl15100w    dl1510ka    ep1050+    fx1050
fx80      hp4M      hp4MPlus    hp4MPlus_a4 hpIIID     hpIIIP
hpIIP     hpIV      ibmpro      la280      la30n      la30n_a4
la30w     la30w_a4  la324      la380      la380cb    la380k
la424     la50      la70       la75       la84       la86
la88      la88c     la90       lf01r      lg02       lg04plus
```

```

lg06      lg08plus  lg12      lg12plus  lg31      lg104plus
lg108plus lj250      ln03      ln03ja    ln03r     ln03s
ln05      ln05ja     ln05r     ln06      ln06r     ln07
ln07r     ln08      ln08r     ln09      ln10ja    ln14
ln17      ln17_a4   ln17ps    ln17ps_a4 ln82r     nec290
ps_level1 ps_level2 remote     xf        unknown

generic_ansi  generic_ansi_a4  generic_text  generic_text_a4

```

or press RETURN for [unknown] : **remote**

Enter printer synonym: **hp5**

Enter printer synonym: **laser5**

Enter printer synonym: **<cr>**

Set spooler directory 'sd' [/usr/spool/lpd] ? **<cr>**

Set printer error log file 'lf' [/usr/adm/lperr] ? **<cr>**

Set remote system name 'rm' [] ? **laserjet5**

Set remote system printer name 'rp' [] ? **text**

Enter the name of the printcap symbol you wish to modify. Other valid entries are:

```

'q'   to quit (no more changes)
'p'   to print the symbols you have specified so far
'l'   to list all of the possible symbols and defaults

```

The names of the printcap symbols are:

```

af br cf ct df dn du fc ff fo fs gf ic if lf lo
lp mc mx nc nf of op os pl pp ps pw px py rf rm
rp rs rw sb sc sd sf sh st tf tr ts uv vf xc xf
xs ya yd yj yp ys yt Da Dl It Lf Lu Ml Nu Or Ot
Ps Sd Si Ss Ul Xf

```

Enter symbol name: **mx**

Enter a new value for symbol 'mx'? [1000] **0**

New 'mx' is '0', is this correct? [y] **<cr>**

Enter symbol name: **sh**

Enter a new value for symbol 'sh'? [off] **on**

New 'sh' is 'on', is this correct? [y] **<cr>**

Enter symbol name: **q**

```

Printer #0
-----
Symbol type value
-----
lf  STR  /usr/adm/lperr
lp  STR
mx  INT  0
rm  STR  laserjet5
rp  STR  text
sd  STR  /usr/spool/lpd
sh  BOOL on

```

Are these the final values for printer 0 ? [y] **<cr>**

Adding comments to printcap file for new printer, type '?' for help.  
Do you want to add comments to the printcap file [n] ? : **<cr>**

Set up activity is complete for this printer.  
Verify that the printer works properly by using  
the lpr(1) command to send files to the printer.

Command < add modify delete exit view quit help >: **q**

4. Edit the `/usr/ics/bin/setupenv` file, changing the value of `LPDEST=` and `PRINTER=` to the name of the print host. In the example above, the value would be either `hp5` or `laser5`. (This is not necessarily the DNS name of the printer. The DNS name should also be added to the synonym list for the printer; although this is not shown in the example.)
5. Shut down and restart the MCC.
6. Print a file from the MCC screen editor. If the file does not print, verify the `/etc/hosts` or DNS name matches the 'rm' entry in the `/etc/printcap` file. Also verify the `/usr/icsbin/setupenv` variables `LPDEST=` and `PRINTER=` match a printer synonym in the `/etc/printcap` file. Printer synonyms reside on the first line of an `/etc/printcap` stanza delimited by vertical bars (`|`). The example `/etc/printcap` file for the preceding example follows:

```

# cat /etc/printcap
lp|lp0|0|hp5|laser5:\
    :lf=/usr/adm/lperr:\
    :lp=:\
    :mx#0:\
    :rm=laserjet5:\
    :rp=text:\
    :sd=/usr/spool/lpd:\
    :sh:

```

If everything is configured correctly and the file still does not print, contact Visara Technical Support.



## Chapter 14 Remote Access to the MCC

This chapter describes how to connect to the MCC from a remote character-based terminal for troubleshooting or support purposes.

## Overview

While an X Terminal or emulation is the recommended method of using the MCC, it is possible that such a terminal will not always be available. In this situation, gwcharcons allows text-only remote console access from any VT100 terminal. This facility is particularly suited to offsite troubleshooting and support.

*Note:* Security privileges for the Login User account and MCC User account also apply to all remote access sessions.

## gwcharcons: Remote Console Access

gwcharcons is a non-GUI (character only) console that allows dial-in and telnet access to the consoles configured in the MCC—the same consoles accessible from the MCC GUI.

### Starting gwcharcons

1. Dial into or connect by telnet to the MCC.
2. Log in with a valid MCC Login User account.
3. When logging into the MCC by telnet or modem a limited menu of choices is offered. Select one of these options:

```
1 MCC Character Console
2 MCC GUI Console
3 MCC HMC GUI Console
4 MCC Full GUI Environment
5 Unix Command Shell on MCC host
6 Exit
Select [1-6]:
```

To use gwcharcons, the Character Console, select option 1. To display a standalone MCC console or the Console Selection Window, select option 2. To display a standalone MCC HMC window, select option 3. To access all the features of the MCC GUI environment, select option 4. To open a new telnet session, or to work on the MCC system, select option 5. To end the session, select option 6.

#### *Notes:*

For any type of extended work on telnet-enabled hosts (such as Unix systems), VISARA recommends selecting option 5 and opening up a telnet session to the host. This may not always be possible due to technical or network failures.

If an asterisk (\*) appears before the name of a console, it is unavailable. This is equivalent to a red colored icon for that console on the Console Selection window. The asterisk disappears if the console later becomes available.

If a question mark (?) appears before the name of a console, an internal problem is preventing the MCC connecting to the console. This is equivalent to a yellow colored icon for that console on the Console Selection window. The question mark disappears if the console later changes state. Contact VISARA Technical Support if the condition persists.

If a non-numeric character is entered at the gwcharcons console selection prompt, the screen may go blank. Enter a valid numeric character to continue.

If a user's console session becomes slow or unresponsive to the MCC's console manager program (for example, because of excess message traffic), the MCC will disconnect from the specific user's console session, and log an error message. This prevents negative effects on other users.

## Using gwcharcons

When first entering gwcharcons, a list of the available consoles is displayed. The following options are available for paging a long list of consoles: P for previous page and N for next page. At the bottom of the screen is a listing of the control keys that are available at other points in the system.

To access a console, type the console number and press <Return> or <Enter> (depending on what sort of keyboard you are using). When using a console, type normally, using <Return> for the <Enter> key.

*Note:* 3270-like terminals require extensive use of the softkeys option discussed below.

## Commands for gwcharcons

There are six commands available with gwcharcons.

| Command | Description                            |
|---------|----------------------------------------|
| Ctrl-E  | Exit gwcharcons                        |
| Ctrl-F  | Enter softkeys/function keys           |
| Ctrl-K  | Enter a control key                    |
| Ctrl-O  | Display history log for this console.  |
| Ctrl-R  | Display or closes help for gwcharcons. |
| Ctrl-T  | Return to Main Screen                  |

*Table 36 gwcharcons Commands*

*Note:* Only Ctrl-E can be used on the initial screen. The other key commands listed above have no effect when typed from the initial screen.

### **Ctrl-E: Exit gwcharcons**

Type Ctrl-E to exit the command-line console at any time.

**Ctrl-F: Enter Softkeys/function keys**

The softkeys window lists the available function keys and softkeys. The use of softkeys allows entry of keystrokes which would normally not be possible with the keyboard currently being used. Help appears along the bottom. Enter the number of a particular entry and press <Return>. Ctrl-F has no effect from the main screen.

**Ctrl-K: Enter control key**

To send a control key, type Ctrl-K. This pops up a small window where the alphabetic equivalent of the control key may be typed. For instance, to send Ctrl-C, type only a C then press <Return>. Ctrl-K has no effect at the main screen.

**Ctrl-O: Display console history log**

Display the console history log for this console. Refer to *Console History Log* on page 172.

**Ctrl-R: Remind**

Displays help for gwcharcons. Enter the Ctrl-R command again to dismiss the reminder.

**Ctrl-T: Return to Main Screen**

From any console, type Ctrl-T to return to the main program window. Ctrl-T has no effect from the main screen.



## Chapter 15 Troubleshooting

This chapter provides basic guidance and steps to take in situations where the MCC system is not operating correctly. It also provides information on the following programs that are helpful when troubleshooting:

- icsmaster
- cfgchk

## General Information

- If any errors occur while working with the MCC, contact VISARA Technical Support. To help VISARA diagnose and correct problems, write down exact error messages, and any actions you were performing at the time of the error.
- The OS prompt for the root account is “#”.

## Problems

### Console Selection Window does not Appear

If a console does not appear in the All tab of the Console Selection Window, check the access privileges in the security editor for the user groups in question. (**Administration** menu—**Configuration:Security** option.)

### Console does not appear

If, after selecting a console, no console window appears, check the following:

- Is the console configured correctly? (Typically only applies to a new console, or if changes have been made to the MCC.)
- Check security to ensure the user has correct permissions to access the related host system.

### Window appears non-functional/non-operable

If a problem occurs with a MCC window, check the following:

- Is the network connection between the user console (MCC terminal) and the MCC host OK?
- Is the MCC network hub correctly running?
- Is the MCC system console operational?

If you can login as “root”, follow these steps:

1. Create a backup as described in *Backing Up Files* on page 186.
2. Restart the MCC.

### Window does not appear/has disappeared

If a MCC window is not displayed, check the following:

- Are other windows functional/operable?
- If so, log in as “root” on the system console and follow these steps:
  1. Create a backup as described in *Backing Up Files* on page 186.
  2. Restart the MCC.

## **MCC stopped/suddenly shut down**

Login as “root” on the system console and follow these steps:

1. Create a backup as described in *Backing Up Files* on page 186.
2. Restart the MCC.

## **Console does not function properly**

If a problem affects a single console, and other consoles are functioning correctly:

- Check the status of the console in the Console Selection window and/or the GWCC (gwcharcons).
- Check the relevant log files. Refer to Chapter 10 Maintaining Log Files for details.
- Is the console cable securely attached to the MCC rack?
- Is the other end of the cable securely attached to the controller?
- Is the console properly defined in the system.cfg file?
- Has the console been properly generated (“genned”)?
- Is console varied online, and as a console? If so, try varying off and back online, and then as a console.
- Are there any other consoles to the same OS? If so, are they functional?
- Is Sysplex being used? If so, are there more than 99 consoles defined? If yes, additional configuration of sysplex will be required.
- If there is a Multiplexer involved, check if the MUX is plugged in. Is the MUX properly connected?

## ICSMASTER

ICSMASTER is a troubleshooting aid that:

- Identifies all VISARA programs that are running on the MCC server.
- Closes the running programs.
- Optionally, logs off all active users.

The options listed here are used with the ICSMASTER program. These options should be used with bin/icsmaster.

| Option                                                     | Description                                                                                                                                                                                                             |
|------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -a                                                         | Display the current system alerts.                                                                                                                                                                                      |
| -A                                                         | Display just the count of current system alerts.                                                                                                                                                                        |
| -b <msg>                                                   | Broadcast the given message to all system GUI users.                                                                                                                                                                    |
| -B                                                         | Show the host boot setting.                                                                                                                                                                                             |
| -B<set>                                                    | Change the host boot setting where <set> is 'on' or 'off'                                                                                                                                                               |
| -c                                                         | Display the current system console stati.                                                                                                                                                                               |
| -C                                                         | Display just the count of current system consoles .                                                                                                                                                                     |
| -D                                                         | Start system background daemons.                                                                                                                                                                                        |
| -F <num>                                                   | Force a cancel of the script on the given initiator                                                                                                                                                                     |
| -h                                                         | Display help                                                                                                                                                                                                            |
| -i                                                         | Display extensive help(advanced options and return codes)                                                                                                                                                               |
| -l                                                         | Check license, returning 0 for valid license, otherwise 5.                                                                                                                                                              |
| -l <name>                                                  | Check maximum allowed connections for given name, where name is one of the keywords: System, Patrol, STARS, Users, EBus, icon, Telnet, Command, TN3270, TN5250.                                                         |
| -n                                                         | Show more processing details (opposite of -q)                                                                                                                                                                           |
| -q                                                         | Keep quit. All messages only go to the log.                                                                                                                                                                             |
| -Q <userID>                                                | Force the given user off of the system.                                                                                                                                                                                 |
| -r <class><br><name><br><script><br><parm1><br><parm2> ... | Run script on CLASS (room, cpu, os, mvsagent), the object's name within the class (use double quotes if using embedded spaces. case sensitive), script name (without using any extension), and any optional parameters. |
| -s                                                         | Display the current system script stati.                                                                                                                                                                                |
| -S                                                         | Display just the count of the current system scripts.                                                                                                                                                                   |

| Option | Description                                                                                                                                                                                                                        |
|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -t     | Check if system is already running, returning 11 if not, otherwise 0.                                                                                                                                                              |
| -T     | Display the length of time the system has been running.                                                                                                                                                                            |
| -u     | Display the current system users.                                                                                                                                                                                                  |
| -U     | Display just the count of current system users.                                                                                                                                                                                    |
| -v     | This option allows you to verify the name and version of the VISARA programs.                                                                                                                                                      |
| -V     | Display details of the name and version                                                                                                                                                                                            |
| -x     | Using this option identifies running processes and resources, then exits. It does not start ICSMASTER. When shutting down the MCC, run this option to verify that all other programs are shut down prior to shutting down the MCC. |
| -X     | This option works like -x except that it attempts to remove phantom processes and resources.<br><b>Caution:</b> Using this option will shut down the MCC, log off all users, and stop all scripts.                                 |

*Table 37 ICSMASTER Options*

## CFGCHK Program

The `cfgchk` configuration checker program checks the MCC configuration files for errors, and writes error messages to stdout or the Execution Log. It may be run either by choosing the Check Configuration option from the Administration menu, or from the command line to troubleshoot configuration problems.

To run `cfgchk` from the menu, select the **Administration** menu—

**Configuration:Check Configuration** option. This runs the configuration checker, routing any error messages to the Execution Log window.

`cfgchk` resides in the `/usr/ics/bin` directory, and should be executed from the directory `/usr/ics`. When `cfgchk` is executed, it writes any warnings or errors to stdout by default. Error messages can be rerouted to a file for viewing or printing.

To run `cfgchk`, enter:

```
bin/cfgchk
```

For a more verbose output, enter:

```
bin/cfgchk -v
```

| Option | Description                                                                                                                                                                                                                                                                                                     |
|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -s     | Check the <code>system.cfg</code> file only (see <i>system.cfg: MCC System</i> on page 46). This data values of each object defined in the <code>system.cfg</code> file. For example, this option reports a console object does not have the interface value defined. It would not report a missing CPU object. |
| -o     | Check the <code>objmgr.cfg</code> file only (see <i>objmgr.cfg: Object Manager</i> on page 47). This data values of each object defined in the <code>objmgr.cfg</code> file. Error reporting is the                                                                                                             |
| -C     | Check the references in all configuration files that have been read. For example, in conjunction with <code>-s</code> would generate a message for a group that references a non                                                                                                                                |
| -r     | Generate a configuration report that lists the types of objects checked and the                                                                                                                                                                                                                                 |
| -l     | Use the MCC logging functions. If the MCC is running, this option directs all error messages to the Execution Log. These messages can be viewed in the Execution Log Window.                                                                                                                                    |
| -v     | Verbose output when checking. This option causes <code>cfgchk</code> to output progress                                                                                                                                                                                                                         |
| -e     | Checks the event configurations for errors. *                                                                                                                                                                                                                                                                   |
| -S     | Checks the security file for errors. *                                                                                                                                                                                                                                                                          |
| -h     | Print the version of <code>cfgchk</code> and lists the available options.                                                                                                                                                                                                                                       |

Table 38 `cfgchk` Options

*Note:* You may wish to contact Visara Technical Support for assistance with the options marked \*.

## Scanning Text Files for ASCII Control Characters

The MCC screen editor does not display ASCII control characters in text files such as configuration (.cfg) files and scripts if the user inadvertently types them. As these characters may cause errors, the configuration files and scripts should be scanned after each editing sessions to identify them.

To use `scanctrl`, call it with a list of file names to scan using a command in the following format:

```
/usr/ics/bin/scanctrl <filenames>
```

For example, the following scans the `system.cfg` and `security.cfg` files:

```
cd /usr/ics
```

```
/usr/ics/bin/scanctrl config/system.cfg config/security.cfg
```

*Note:* The `scanctrl` program requires `perl` to be installed in `/usr/local/bin`. For information on installing `perl`, contact Visara Technical Support.

- The wildcard character (\*) may be used.
- Non-text files in referenced directories are ignored.
- The program shows the files that contain ASCII control characters and prints the affected line number(s), but takes no action to remove those characters.

## Scanning the Configuration Files

To scan all configuration files after an editing session, enter:

```
/usr/ics/bin/scanctrl /usr/ics/config/*
```

An example output follows:

```
hermod:/usr/home/danders/pl> /usr/ics/bin/scanctrl /usr/ics/config/*
/usr/ics/config/charset.cfg, OK
/usr/ics/config/event.cfg, OK
/usr/ics/config/fonts.cfg, OK
/usr/ics/config/gclrund.txt, OK
/usr/ics/config/groups.cfg, OK
/usr/ics/config/icsmaster.txt, OK
/usr/ics/config/icsmaster.txt.bak, OK
/usr/ics/config/keymap.cfg, OK
/usr/ics/config/license.cfg, OK
/usr/ics/config/objmgr.cfg, 187 *****
/usr/ics/config/osgroup.cfg, OK
/usr/ics/config/rgb.txt, OK
/usr/ics/config/security.cfg, OK
```

```
/usr/ics/config/snmp.cfg, OK
/usr/ics/config/status.cfg, OK
/usr/ics/config/system.cfg, 31, 108 *****
/usr/ics/config/MCCsessioncleanup.txt, OK
```

When no control characters are found, “OK” is appended to the end of the output line. When control characters are found, the line is appended with the location of the characters and the string “\*\*\*\*\*”. In the example, control characters were detected in objmgr.cfg on line 187, and in system.cfg on line 31 and 108.

## Scanning Scripts

To scan all scripts after an editing session, enter:

```
/usr/ics/bin/scanctrl /usr/ics/script/*
```

An example output follows:

```
MCCqa:/usr/home/d> /usr/ics/bin/scanctrl /usr/ics/script/qa_*
/usr/ics/script/qa_alarm.scr, OK
/usr/ics/script/qa_alen.scr, OK
/usr/ics/script/qa_alert.scr, OK
/usr/ics/script/qa_aset.scr, OK
/usr/ics/script/qa_ascii.scr, OK
/usr/ics/script/qa_ascrn.scr, OK
/usr/ics/script/qa_asort.scr, OK
/usr/ics/script/qa_asquare_main.scr, OK
/usr/ics/script/qa_asquare_sub.scr, OK
/usr/ics/script/qa_assockkeys.scr, OK
/usr/ics/script/qa_atstr.scr, 52, 54 *****
/usr/ics/script/qa_cat_read.scr, OK
/usr/ics/script/qa_charlose.scr, OK
/usr/ics/script/qa_charlose2.scr, OK
/usr/ics/script/qa_charlose3.scr, OK
/usr/ics/script/qa_charlose_call.scr, OK
/usr/ics/script/qa_charlose_sub.scr, OK
/usr/ics/script/qa_class.scr, OK
/usr/ics/script/qa_class_call.scr, OK
/usr/ics/script/qa_codec.scr, 67 *****
/usr/ics/script/qa_conslog.scr, OK
/usr/ics/script/qa_const_check.scr, OK
/usr/ics/script/qa_const_check2.scr, OK
/usr/ics/script/qa_event.scr, OK
/usr/ics/script/qa_event_key.scr, OK
/usr/ics/script/qa_event_log.scr, OK
/usr/ics/script/qa_eventedit.scr, OK
/usr/ics/script/qa_eventedit_sub.scr, OK
/usr/ics/script/qa_formatstr.scr, OK
```

*Note:* Compiled scripts (.scx files) are ignored.



## **Chapter 16 Integrating Other Products with the MCC**

This chapter provides an overview of how to integrate some third-party products for use with the MCC.

## Launching a Display of Console Selection window

To invoke the Console Selection window, the program or user must pass the following arguments to the wrapper script:

```
MCC [-d display] gwconsole
```

where “display” is the name of the display on which the console “console\_name” will appear. If the display is not specified, the current value of the DISPLAY environment variable is used by default.

*Note:* For details of how to invoke a Console Selection window from the full MCC GUI environment, refer to *Chapter 3 Selecting Consoles* in the *Operations Guide*.

## To Display a Standalone Console

To invoke a standalone console, the program or user must pass the following arguments to the MCC:

```
MCC [-d display] gwconsole -console "console_name"
```

where “display” is the name of the display on which the console “console\_name” will appear. If the display is not specified, the current display is used by default.

For example, the following command opens a “SysA” console on the display called “user4:0.0”, where “SysA” is the name of the console as specified in the MCC configuration:

```
MCC -d user4:0.0 gwconsole -console SysA
```

## To Display a Printer Console

To invoke a printer console, the program or user must pass the following arguments to the wrapper script:

```
MCC [-d display] gwconsole -printer "console_name"
```

where “display” is the name of the display on which the console “console\_name” will appear. If the display is not specified, the current display is used by default.

For example, the following command opens printer console “SysA PRN” on the default display:

```
MCC gwconsole -printer "SysA PRN"
```

## Implementation Notes

### **General**

- The launching program or user must be added with the proper security permissions as:
  - A Unix login user.
  - A MCC user.
  - A member of the appropriate security group(s) as required.
- Refer to Chapter 8 Administering Users for details.
- Access permissions may also be required on the host system to run the window.
- The display can be set before the script is called, in which case it may be omitted from the command.
- Errors and other output messages from the script are routed to the Execution Log, and are also echoed to the terminal from which the command was entered, if applicable.

### **Consoles Only**

- In each command, “console\_name” should be replaced by the actual console name. This should be enclosed in quotes if the name includes spaces.
- If a console name is not specified in the command, the Console Selection window displays. If no arguments are specified, the MCC master window displays, and the full MCC GUI environment is launched.
- The console name must be entered exactly as specified in the system.cfg file, for example, “SysA”, “SysA PRN”, or “EB\_28\_P”.
- This feature may also be used to launch a Command Console. See *Command Console* on page 96 for information on defining Command Consoles.
- If “-printer” and “-console” are included in the same command, the program does not run and no console is displayed.

## **Ataman Telnet**

This product may be used in place of the telnet client supplied with Windows NT.

Refer to the Ataman TCP Remote Logon Services User's Manual which is installed on the PC when the Ataman TCP Remote Logon Services program is installed. The file name of this document is "userman.doc".

## Appendix A Valid Color Names

| Color Name      | RGB Numbers |
|-----------------|-------------|
| alice blue      | 240 248 255 |
| AliceBlue       | 240 248 255 |
| antique white   | 250 235 215 |
| AntiqueWhite    | 250 235 215 |
| AntiqueWhite1   | 255 239 219 |
| AntiqueWhite2   | 238 223 204 |
| AntiqueWhite3   | 205 192 176 |
| AntiqueWhite4   | 139 131 120 |
| aquamarine      | 127 255 212 |
| aquamarine1     | 127 255 212 |
| aquamarine2     | 118 238 198 |
| aquamarine3     | 102 205 170 |
| aquamarine4     | 69 139 116  |
| azure           | 240 255 255 |
| azure1          | 240 255 255 |
| azure2          | 224 238 238 |
| azure3          | 193 205 205 |
| azure4          | 131 139 139 |
| beige           | 245 245 220 |
| bisque          | 255 228 196 |
| bisque1         | 255 228 196 |
| bisque2         | 238 213 183 |
| bisque3         | 205 183 158 |
| bisque4         | 139 125 107 |
| black           | 0 0 0       |
| blanched almond | 255 235 205 |
| BlanchedAlmond  | 255 235 205 |
| blue            | 0 0 255     |
| blue violet     | 138 43 226  |
| blue1           | 0 0 255     |
| blue2           | 0 0 238     |
| blue3           | 0 0 205     |
| blue4           | 0 0 139     |
| BlueViolet      | 138 43 226  |
| brown           | 165 42 42   |
| brown1          | 255 64 64   |
| brown2          | 238 59 59   |
| brown3          | 205 51 51   |
| brown4          | 139 35 35   |
| burlywood       | 222 184 135 |
| burlywood1      | 255 211 155 |
| burlywood2      | 238 197 145 |

| Color Name       | RGB Numbers |
|------------------|-------------|
| burlywood3       | 205 170 125 |
| burlywood4       | 139 115 85  |
| cadet blue       | 95 158 160  |
| CadetBlue        | 95 158 160  |
| CadetBlue1       | 152 245 255 |
| CadetBlue2       | 142 229 238 |
| CadetBlue3       | 122 197 205 |
| CadetBlue4       | 83 134 139  |
| chartreuse       | 127 255 0   |
| chartreuse1      | 127 255 0   |
| chartreuse2      | 118 238 0   |
| chartreuse3      | 102 205 0   |
| chartreuse4      | 69 139 0    |
| chocolate        | 210 105 30  |
| chocolate1       | 255 127 36  |
| chocolate2       | 238 118 33  |
| chocolate3       | 205 102 29  |
| chocolate4       | 139 69 19   |
| coral            | 255 127 80  |
| coral1           | 255 114 86  |
| coral2           | 238 106 80  |
| coral3           | 205 91 69   |
| coral4           | 139 62 47   |
| cornflower blue  | 100 149 237 |
| CornflowerBlue   | 100 149 237 |
| cornsilk         | 255 248 220 |
| cornsilk1        | 255 248 220 |
| cornsilk2        | 238 232 205 |
| cornsilk3        | 205 200 177 |
| cornsilk4        | 139 136 120 |
| cyan             | 0 255 255   |
| cyan1            | 0 255 255   |
| cyan2            | 0 238 238   |
| cyan3            | 0 205 205   |
| cyan4            | 0 139 139   |
| dark goldenrod   | 184 134 11  |
| dark green       | 0 100 0     |
| dark khaki       | 189 183 107 |
| dark olive green | 85 107 47   |
| dark orange      | 255 140 0   |
| dark orchid      | 153 50 204  |
| dark salmon      | 233 150 122 |

| Color Name      | RGB Numbers |
|-----------------|-------------|
| dark sea green  | 143 188 143 |
| dark slate blue | 72 61 139   |
| dark slate gray | 47 79 79    |
| dark slate grey | 47 79 79    |
| dark turquoise  | 0 206 209   |
| dark violet     | 148 0 211   |
| DarkGoldenrod   | 184 134 11  |
| DarkGoldenrod1  | 255 185 15  |
| DarkGoldenrod2  | 238 173 14  |
| DarkGoldenrod3  | 205 149 12  |
| DarkGoldenrod4  | 139 101 8   |
| DarkGreen       | 0 100 0     |
| DarkKhaki       | 189 183 107 |
| DarkOliveGreen  | 85 107 47   |
| DarkOliveGreen1 | 202 255 112 |
| DarkOliveGreen2 | 188 238 104 |
| DarkOliveGreen3 | 162 205 90  |
| DarkOliveGreen4 | 110 139 61  |
| DarkOrange      | 255 140 0   |
| DarkOrange1     | 255 127 0   |
| DarkOrange2     | 238 118 0   |
| DarkOrange3     | 205 102 0   |
| DarkOrange4     | 139 69 0    |
| DarkOrchid      | 153 50 204  |
| DarkOrchid1     | 191 62 255  |
| DarkOrchid2     | 178 58 238  |
| DarkOrchid3     | 154 50 205  |
| DarkOrchid4     | 104 34 139  |
| DarkSalmon      | 233 150 122 |
| DarkSeaGreen    | 143 188 143 |
| DarkSeaGreen1   | 193 255 193 |
| DarkSeaGreen2   | 180 238 180 |
| DarkSeaGreen3   | 155 205 155 |
| DarkSeaGreen4   | 105 139 105 |
| DarkSlateBlue   | 72 61 139   |
| DarkSlateGray   | 47 79 79    |
| DarkSlateGray1  | 151 255 255 |
| DarkSlateGray2  | 141 238 238 |
| DarkSlateGray3  | 121 205 205 |
| DarkSlateGray4  | 82 139 139  |
| DarkSlateGrey   | 47 79 79    |
| DarkTurquoise   | 0 206 209   |
| DarkViolet      | 148 0 211   |
| decwblue        | 0 171 232   |
| DECWBlue        | 0 171 232   |
| deep pink       | 255 20 147  |
| deep sky blue   | 0 191 255   |
| DeepPink        | 255 20 147  |

| Color Name   | RGB Numbers |
|--------------|-------------|
| DeepPink1    | 255 20 147  |
| DeepPink2    | 238 18 137  |
| DeepPink3    | 205 16 118  |
| DeepPink4    | 139 10 80   |
| DeepSkyBlue  | 0 191 255   |
| DeepSkyBlue1 | 0 191 255   |
| DeepSkyBlue2 | 0 178 238   |
| DeepSkyBlue3 | 0 154 205   |
| DeepSkyBlue4 | 0 104 139   |
| dim gray     | 105 105 105 |
| dim grey     | 105 105 105 |
| DimGray      | 105 105 105 |
| DimGrey      | 105 105 105 |
| dodger blue  | 30 144 255  |
| DodgerBlue   | 30 144 255  |
| DodgerBlue1  | 30 144 255  |
| DodgerBlue2  | 28 134 238  |
| DodgerBlue3  | 24 116 205  |
| DodgerBlue4  | 16 78 139   |
| firebrick    | 178 34 34   |
| firebrick1   | 255 48 48   |
| firebrick2   | 238 44 44   |
| firebrick3   | 205 38 38   |
| firebrick4   | 139 26 26   |
| floral white | 255 250 240 |
| FloralWhite  | 255 250 240 |
| forest green | 34 139 34   |
| ForestGreen  | 34 139 34   |
| gainsboro    | 220 220 220 |
| ghost white  | 248 248 255 |
| GhostWhite   | 248 248 255 |
| gold         | 255 215 0   |
| gold1        | 255 215 0   |
| gold2        | 238 201 0   |
| gold3        | 205 173 0   |
| gold4        | 139 117 0   |
| goldenrod    | 218 165 32  |
| goldenrod1   | 255 193 37  |
| goldenrod2   | 238 180 34  |
| goldenrod3   | 205 155 29  |
| goldenrod4   | 139 105 20  |
| gray         | 192 192 192 |
| gray0        | 0 0 0       |
| gray1        | 3 3 3       |
| gray10       | 26 26 26    |
| gray100      | 255 255 255 |
| gray11       | 28 28 28    |
| gray12       | 31 31 31    |

| Color Name | RGB Numbers |
|------------|-------------|
| gray13     | 33 33 33    |
| gray14     | 36 36 36    |
| gray15     | 38 38 38    |
| gray16     | 41 41 41    |
| gray17     | 43 43 43    |
| gray18     | 46 46 46    |
| gray19     | 48 48 48    |
| gray2      | 5 5 5       |
| gray20     | 51 51 51    |
| gray21     | 54 54 54    |
| gray22     | 56 56 56    |
| gray23     | 59 59 59    |
| gray24     | 61 61 61    |
| gray25     | 64 64 64    |
| gray26     | 66 66 66    |
| gray27     | 69 69 69    |
| gray28     | 71 71 71    |
| gray29     | 74 74 74    |
| gray3      | 8 8 8       |
| gray30     | 77 77 77    |
| gray31     | 79 79 79    |
| gray32     | 82 82 82    |
| gray33     | 84 84 84    |
| gray34     | 87 87 87    |
| gray35     | 89 89 89    |
| gray36     | 92 92 92    |
| gray37     | 94 94 94    |
| gray38     | 97 97 97    |
| gray39     | 99 99 99    |
| gray4      | 10 10 10    |
| gray40     | 102 102 102 |
| gray41     | 105 105 105 |
| gray42     | 107 107 107 |
| gray43     | 110 110 110 |
| gray44     | 112 112 112 |
| gray45     | 115 115 115 |
| gray46     | 117 117 117 |
| gray47     | 120 120 120 |
| gray48     | 122 122 122 |
| gray49     | 125 125 125 |
| gray5      | 13 13 13    |
| gray50     | 127 127 127 |
| gray51     | 130 130 130 |
| gray52     | 133 133 133 |
| gray53     | 135 135 135 |
| gray54     | 138 138 138 |
| gray55     | 140 140 140 |
| gray56     | 143 143 143 |

| Color Name | RGB Numbers |
|------------|-------------|
| gray57     | 145 145 145 |
| gray58     | 148 148 148 |
| gray59     | 150 150 150 |
| gray6      | 15 15 15    |
| gray60     | 153 153 153 |
| gray61     | 156 156 156 |
| gray62     | 158 158 158 |
| gray63     | 161 161 161 |
| gray64     | 163 163 163 |
| gray65     | 166 166 166 |
| gray66     | 168 168 168 |
| gray67     | 171 171 171 |
| gray68     | 173 173 173 |
| gray69     | 176 176 176 |
| gray7      | 18 18 18    |
| gray70     | 179 179 179 |
| gray71     | 181 181 181 |
| gray72     | 184 184 184 |
| gray73     | 186 186 186 |
| gray74     | 189 189 189 |
| gray75     | 191 191 191 |
| gray76     | 194 194 194 |
| gray77     | 196 196 196 |
| gray78     | 199 199 199 |
| gray79     | 201 201 201 |
| gray8      | 20 20 20    |
| gray80     | 204 204 204 |
| gray81     | 207 207 207 |
| gray82     | 209 209 209 |
| gray83     | 212 212 212 |
| gray84     | 214 214 214 |
| gray85     | 217 217 217 |
| gray86     | 219 219 219 |
| gray87     | 222 222 222 |
| gray88     | 224 224 224 |
| gray89     | 227 227 227 |
| gray9      | 23 23 23    |
| gray90     | 229 229 229 |
| gray91     | 232 232 232 |
| gray92     | 235 235 235 |
| gray93     | 237 237 237 |
| gray94     | 240 240 240 |
| gray95     | 242 242 242 |
| gray96     | 245 245 245 |
| gray97     | 247 247 247 |
| gray98     | 250 250 250 |
| gray99     | 252 252 252 |
| green      | 0 255 0     |

| Color Name   | RGB Numbers |
|--------------|-------------|
| green yellow | 173 255 47  |
| green1       | 0 255 0     |
| green2       | 0 238 0     |
| green3       | 0 205 0     |
| green4       | 0 139 0     |
| GreenYellow  | 173 255 47  |
| grey         | 192 192 192 |
| grey0        | 0 0 0       |
| grey1        | 3 3 3       |
| grey10       | 26 26 26    |
| grey100      | 255 255 255 |
| grey11       | 28 28 28    |
| grey12       | 31 31 31    |
| grey13       | 33 33 33    |
| grey14       | 36 36 36    |
| grey15       | 38 38 38    |
| grey16       | 41 41 41    |
| grey17       | 43 43 43    |
| grey18       | 46 46 46    |
| grey19       | 48 48 48    |
| grey2        | 5 5 5       |
| grey20       | 51 51 51    |
| grey21       | 54 54 54    |
| grey22       | 56 56 56    |
| grey23       | 59 59 59    |
| grey24       | 61 61 61    |
| grey25       | 64 64 64    |
| grey26       | 66 66 66    |
| grey27       | 69 69 69    |
| grey28       | 71 71 71    |
| grey29       | 74 74 74    |
| grey3        | 8 8 8       |
| grey30       | 77 77 77    |
| grey31       | 79 79 79    |
| grey32       | 82 82 82    |
| grey33       | 84 84 84    |
| grey34       | 87 87 87    |
| grey35       | 89 89 89    |
| grey36       | 92 92 92    |
| grey37       | 94 94 94    |
| grey38       | 97 97 97    |
| grey39       | 99 99 99    |
| grey4        | 10 10 10    |
| grey40       | 102 102 102 |
| grey41       | 105 105 105 |
| grey42       | 107 107 107 |
| grey43       | 110 110 110 |
| grey44       | 112 112 112 |

| Color Name | RGB Numbers |
|------------|-------------|
| grey45     | 115 115 115 |
| grey46     | 117 117 117 |
| grey47     | 120 120 120 |
| grey48     | 122 122 122 |
| grey49     | 125 125 125 |
| grey5      | 13 13 13    |
| grey50     | 127 127 127 |
| grey51     | 130 130 130 |
| grey52     | 133 133 133 |
| grey53     | 135 135 135 |
| grey54     | 138 138 138 |
| grey55     | 140 140 140 |
| grey56     | 143 143 143 |
| grey57     | 145 145 145 |
| grey58     | 148 148 148 |
| grey59     | 150 150 150 |
| grey6      | 15 15 15    |
| grey60     | 153 153 153 |
| grey61     | 156 156 156 |
| grey62     | 158 158 158 |
| grey63     | 161 161 161 |
| grey64     | 163 163 163 |
| grey65     | 166 166 166 |
| grey66     | 168 168 168 |
| grey67     | 171 171 171 |
| grey68     | 173 173 173 |
| grey69     | 176 176 176 |
| grey7      | 18 18 18    |
| grey70     | 179 179 179 |
| grey71     | 181 181 181 |
| grey72     | 184 184 184 |
| grey73     | 186 186 186 |
| grey74     | 189 189 189 |
| grey75     | 191 191 191 |
| grey76     | 194 194 194 |
| grey77     | 196 196 196 |
| grey78     | 199 199 199 |
| grey79     | 201 201 201 |
| grey8      | 20 20 20    |
| grey80     | 204 204 204 |
| grey81     | 207 207 207 |
| grey82     | 209 209 209 |
| grey83     | 212 212 212 |
| grey84     | 214 214 214 |
| grey85     | 217 217 217 |
| grey86     | 219 219 219 |
| grey87     | 222 222 222 |
| grey88     | 224 224 224 |

| Color Name     | RGB Numbers |
|----------------|-------------|
| grey89         | 227 227 227 |
| grey9          | 23 23 23    |
| grey90         | 229 229 229 |
| grey91         | 232 232 232 |
| grey92         | 235 235 235 |
| grey93         | 237 237 237 |
| grey94         | 240 240 240 |
| grey95         | 242 242 242 |
| grey96         | 245 245 245 |
| grey97         | 247 247 247 |
| grey98         | 250 250 250 |
| grey99         | 252 252 252 |
| honeydew       | 240 255 240 |
| honeydew1      | 240 255 240 |
| honeydew2      | 224 238 224 |
| honeydew3      | 193 205 193 |
| honeydew4      | 131 139 131 |
| hot pink       | 255 105 180 |
| HotPink        | 255 105 180 |
| HotPink1       | 255 110 180 |
| HotPink2       | 238 106 167 |
| HotPink3       | 205 96 144  |
| HotPink4       | 139 58 98   |
| indian red     | 205 92 92   |
| IndianRed      | 205 92 92   |
| IndianRed1     | 255 106 106 |
| IndianRed2     | 238 99 99   |
| IndianRed3     | 205 85 85   |
| IndianRed4     | 139 58 58   |
| ivory          | 255 255 240 |
| ivory1         | 255 255 240 |
| ivory2         | 238 238 224 |
| ivory3         | 205 205 193 |
| ivory4         | 139 139 131 |
| khaki          | 240 230 140 |
| khaki1         | 255 246 143 |
| khaki2         | 238 230 133 |
| khaki3         | 205 198 115 |
| khaki4         | 139 134 78  |
| lavender       | 230 230 250 |
| lavender blush | 255 240 245 |
| LavenderBlush  | 255 240 245 |
| LavenderBlush1 | 255 240 245 |
| LavenderBlush2 | 238 224 229 |
| LavenderBlush3 | 205 193 197 |
| LavenderBlush4 | 139 131 134 |
| lawn green     | 124 252 0   |
| LawnGreen      | 124 252 0   |

| Color Name             | RGB Numbers |
|------------------------|-------------|
| lemon chiffon          | 255 250 205 |
| LemonChiffon           | 255 250 205 |
| LemonChiffon1          | 255 250 205 |
| LemonChiffon2          | 238 233 191 |
| LemonChiffon3          | 205 201 165 |
| LemonChiffon4          | 139 137 112 |
| light blue             | 173 216 230 |
| light coral            | 240 128 128 |
| light cyan             | 224 255 255 |
| light goldenrod        | 238 221 130 |
| light goldenrod yellow | 250 250 210 |
| light gray             | 211 211 211 |
| light grey             | 211 211 211 |
| light pink             | 255 182 193 |
| light salmon           | 255 160 122 |
| light sea green        | 32 178 170  |
| light sky blue         | 135 206 250 |
| light slate blue       | 132 112 255 |
| light slate gray       | 119 136 153 |
| light slate grey       | 119 136 153 |
| light steel blue       | 176 196 222 |
| light yellow           | 255 255 224 |
| LightBlue              | 173 216 230 |
| LightBlue1             | 191 239 255 |
| LightBlue2             | 178 223 238 |
| LightBlue3             | 154 192 205 |
| LightBlue4             | 104 131 139 |
| LightCoral             | 240 128 128 |
| LightCyan              | 224 255 255 |
| LightCyan1             | 224 255 255 |
| LightCyan2             | 209 238 238 |
| LightCyan3             | 180 205 205 |
| LightCyan4             | 122 139 139 |
| LightGoldenrod         | 238 221 130 |
| LightGoldenrod1        | 255 236 139 |
| LightGoldenrod2        | 238 220 130 |
| LightGoldenrod3        | 205 190 112 |
| LightGoldenrod4        | 139 129 76  |
| LightGoldenrodYllw     | 250 250 210 |
| LightGray              | 211 211 211 |
| LightGrey              | 211 211 211 |
| LightPink              | 255 182 193 |
| LightPink1             | 255 174 185 |
| LightPink2             | 238 162 173 |
| LightPink3             | 205 140 149 |
| LightPink4             | 139 95 101  |
| LightSalmon            | 255 160 122 |
| LightSalmon1           | 255 160 122 |

| Color Name          | RGB Numbers |
|---------------------|-------------|
| LightSalmon2        | 238 149 114 |
| LightSalmon3        | 205 129 98  |
| LightSalmon4        | 139 87 66   |
| LightSeaGreen       | 32 178 170  |
| LightSkyBlue        | 135 206 250 |
| LightSkyBlue1       | 176 226 255 |
| LightSkyBlue2       | 164 211 238 |
| LightSkyBlue3       | 141 182 205 |
| LightSkyBlue4       | 96 123 139  |
| LightSlateBlue      | 132 112 255 |
| LightSlateGray      | 119 136 153 |
| LightSlateGrey      | 119 136 153 |
| LightSteelBlue      | 176 196 222 |
| LightSteelBlue1     | 202 225 255 |
| LightSteelBlue2     | 188 210 238 |
| LightSteelBlue3     | 162 181 205 |
| LightSteelBlue4     | 110 123 139 |
| LightYellow         | 255 255 224 |
| LightYellow1        | 255 255 224 |
| LightYellow2        | 238 238 209 |
| LightYellow3        | 205 205 180 |
| LightYellow4        | 139 139 122 |
| lime green          | 50 205 50   |
| LimeGreen           | 50 205 50   |
| linen               | 250 240 230 |
| magenta             | 255 0 255   |
| magenta1            | 255 0 255   |
| magenta2            | 238 0 238   |
| magenta3            | 205 0 205   |
| magenta4            | 139 0 139   |
| maroon              | 176 48 96   |
| maroon1             | 255 52 179  |
| maroon2             | 238 48 167  |
| maroon3             | 205 41 144  |
| maroon4             | 139 28 98   |
| medium aquamarine   | 102 205 170 |
| medium blue         | 0 0 205     |
| medium forest green | 107 143 36  |
| medium goldenrod    | 235 235 173 |
| medium orchid       | 186 85 211  |
| medium purple       | 147 112 219 |
| medium sea green    | 60 179 113  |
| medium slate blue   | 123 104 238 |
| medium spring green | 0 250 154   |
| medium turquoise    | 72 209 204  |
| medium violet red   | 199 21 133  |
| MediumAquamarine    | 102 205 170 |
| MediumBlue          | 0 0 205     |

| Color Name        | RGB Numbers |
|-------------------|-------------|
| MediumForestGreen | 107 143 36  |
| MediumGoldenrod   | 235 235 173 |
| MediumOrchid      | 186 85 211  |
| MediumOrchid1     | 224 102 255 |
| MediumOrchid2     | 209 95 238  |
| MediumOrchid3     | 180 82 205  |
| MediumOrchid4     | 122 55 139  |
| MediumPurple      | 147 112 219 |
| MediumPurple1     | 171 130 255 |
| MediumPurple2     | 159 121 238 |
| MediumPurple3     | 137 104 205 |
| MediumPurple4     | 93 71 139   |
| MediumSeaGreen    | 60 179 113  |
| MediumSlateBlue   | 123 104 238 |
| MediumSpringGreen | 0 250 154   |
| MediumTurquoise   | 72 209 204  |
| MediumVioletRed   | 199 21 133  |
| midnight blue     | 25 25 112   |
| MidnightBlue      | 25 25 112   |
| mint cream        | 245 255 250 |
| MintCream         | 245 255 250 |
| misty rose        | 255 228 225 |
| MistyRose         | 255 228 225 |
| MistyRose1        | 255 228 225 |
| MistyRose2        | 238 213 210 |
| MistyRose3        | 205 183 181 |
| MistyRose4        | 139 125 123 |
| moccasin          | 255 228 181 |
| navajo white      | 255 222 173 |
| NavajoWhite       | 255 222 173 |
| NavajoWhite1      | 255 222 173 |
| NavajoWhite2      | 238 207 161 |
| NavajoWhite3      | 205 179 139 |
| NavajoWhite4      | 139 121 94  |
| navy              | 0 0 128     |
| navy blue         | 0 0 128     |
| NavyBlue          | 0 0 128     |
| old lace          | 253 245 230 |
| OldLace           | 253 245 230 |
| olive drab        | 107 142 35  |
| OliveDrab         | 107 142 35  |
| OliveDrab1        | 192 255 62  |
| OliveDrab2        | 179 238 58  |
| OliveDrab3        | 154 205 50  |
| OliveDrab4        | 105 139 34  |
| orange            | 255 165 0   |
| orange red        | 255 69 0    |
| orange1           | 255 165 0   |

| Color Name      | RGB Numbers |
|-----------------|-------------|
| orange2         | 238 154 0   |
| orange3         | 205 133 0   |
| orange4         | 139 90 0    |
| OrangeRed       | 255 69 0    |
| OrangeRed1      | 255 69 0    |
| OrangeRed2      | 238 64 0    |
| OrangeRed3      | 205 55 0    |
| OrangeRed4      | 139 37 0    |
| orchid          | 218 112 214 |
| orchid1         | 255 131 250 |
| orchid2         | 238 122 233 |
| orchid3         | 205 105 201 |
| orchid4         | 139 71 137  |
| pale goldenrod  | 238 232 170 |
| pale green      | 152 251 152 |
| pale turquoise  | 175 238 238 |
| pale violet red | 219 112 147 |
| PaleGoldenrod   | 238 232 170 |
| PaleGreen       | 152 251 152 |
| PaleGreen1      | 154 255 154 |
| PaleGreen2      | 144 238 144 |
| PaleGreen3      | 124 205 124 |
| PaleGreen4      | 84 139 84   |
| PaleTurquoise   | 175 238 238 |
| PaleTurquoise1  | 187 255 255 |
| PaleTurquoise2  | 174 238 238 |
| PaleTurquoise3  | 150 205 205 |
| PaleTurquoise4  | 102 139 139 |
| PaleVioletRed   | 219 112 147 |
| PaleVioletRed1  | 255 130 171 |
| PaleVioletRed2  | 238 121 159 |
| PaleVioletRed3  | 205 104 137 |
| PaleVioletRed4  | 139 71 93   |
| papaya whip     | 255 239 213 |
| PapayaWhip      | 255 239 213 |
| peach puff      | 255 218 185 |
| PeachPuff       | 255 218 185 |
| PeachPuff1      | 255 218 185 |
| PeachPuff2      | 238 203 173 |
| PeachPuff3      | 205 175 149 |
| PeachPuff4      | 139 119 101 |
| peru            | 205 133 63  |
| pink            | 255 192 203 |
| pink1           | 255 181 197 |
| pink2           | 238 169 184 |
| pink3           | 205 145 158 |
| pink4           | 139 99 108  |
| plum            | 221 160 221 |

| Color Name   | RGB Numbers |
|--------------|-------------|
| plum1        | 255 187 255 |
| plum2        | 238 174 238 |
| plum3        | 205 150 205 |
| plum4        | 139 102 139 |
| powder blue  | 176 224 230 |
| PowderBlue   | 176 224 230 |
| purple       | 160 32 240  |
| purple1      | 155 48 255  |
| purple2      | 145 44 238  |
| purple3      | 125 38 205  |
| purple4      | 85 26 139   |
| red          | 255 0 0     |
| red1         | 255 0 0     |
| red2         | 238 0 0     |
| red3         | 205 0 0     |
| red4         | 139 0 0     |
| rosy brown   | 188 143 143 |
| RosyBrown    | 188 143 143 |
| RosyBrown1   | 255 193 193 |
| RosyBrown2   | 238 180 180 |
| RosyBrown3   | 205 155 155 |
| RosyBrown4   | 139 105 105 |
| royal blue   | 65 105 225  |
| RoyalBlue    | 65 105 225  |
| RoyalBlue1   | 72 118 255  |
| RoyalBlue2   | 67 110 238  |
| RoyalBlue3   | 58 95 205   |
| RoyalBlue4   | 39 64 139   |
| saddle brown | 139 69 19   |
| SaddleBrown  | 139 69 19   |
| salmon       | 250 128 114 |
| salmon1      | 255 140 105 |
| salmon2      | 238 130 98  |
| salmon3      | 205 112 84  |
| salmon4      | 139 76 57   |
| sandy brown  | 244 164 96  |
| SandyBrown   | 244 164 96  |
| sea green    | 46 139 87   |
| SeaGreen     | 46 139 87   |
| SeaGreen1    | 84 255 159  |
| SeaGreen2    | 78 238 148  |
| SeaGreen3    | 67 205 128  |
| SeaGreen4    | 46 139 87   |
| seashell     | 255 245 238 |
| seashell1    | 255 245 238 |
| seashell2    | 238 229 222 |
| seashell3    | 205 197 191 |
| seashell4    | 139 134 130 |

| Color Name   | RGB Numbers |
|--------------|-------------|
| sienna       | 160 82 45   |
| sienna1      | 255 130 71  |
| sienna2      | 238 121 66  |
| sienna3      | 205 104 57  |
| sienna4      | 139 71 38   |
| sky blue     | 135 206 235 |
| SkyBlue      | 135 206 235 |
| SkyBlue1     | 135 206 255 |
| SkyBlue2     | 126 192 238 |
| SkyBlue3     | 108 166 205 |
| SkyBlue4     | 74 112 139  |
| slate blue   | 106 90 205  |
| slate gray   | 112 128 144 |
| slate grey   | 112 128 144 |
| SlateBlue    | 106 90 205  |
| SlateBlue1   | 131 111 255 |
| SlateBlue2   | 122 103 238 |
| SlateBlue3   | 105 89 205  |
| SlateBlue4   | 71 60 139   |
| SlateGray    | 112 128 144 |
| SlateGray1   | 198 226 255 |
| SlateGray2   | 185 211 238 |
| SlateGray3   | 159 182 205 |
| SlateGray4   | 108 123 139 |
| SlateGrey    | 112 128 144 |
| snow         | 255 250 250 |
| snow1        | 255 250 250 |
| snow2        | 238 233 233 |
| snow3        | 205 201 201 |
| snow4        | 139 137 137 |
| spring green | 0 255 127   |
| SpringGreen  | 0 255 127   |
| SpringGreen1 | 0 255 127   |
| SpringGreen2 | 0 238 118   |
| SpringGreen3 | 0 205 102   |
| SpringGreen4 | 0 139 69    |
| steel blue   | 70 130 180  |
| SteelBlue    | 70 130 180  |
| SteelBlue1   | 99 184 255  |
| SteelBlue2   | 92 172 238  |
| SteelBlue3   | 79 148 205  |
| SteelBlue4   | 54 100 139  |
| tan          | 210 180 140 |
| tan1         | 255 165 79  |
| tan2         | 238 154 73  |
| tan3         | 205 133 63  |
| tan4         | 139 90 43   |
| thistle      | 216 191 216 |

| Color Name   | RGB Numbers |
|--------------|-------------|
| thistle1     | 255 225 255 |
| thistle2     | 238 210 238 |
| thistle3     | 205 181 205 |
| thistle4     | 139 123 139 |
| tomato       | 255 99 71   |
| tomato1      | 255 99 71   |
| tomato2      | 238 92 66   |
| tomato3      | 205 79 57   |
| tomato4      | 139 54 38   |
| turquoise    | 64 224 208  |
| turquoise1   | 0 245 255   |
| turquoise2   | 0 229 238   |
| turquoise3   | 0 197 205   |
| turquoise4   | 0 134 139   |
| violet       | 238 130 238 |
| violet red   | 208 32 144  |
| VioletRed    | 208 32 144  |
| VioletRed1   | 255 62 150  |
| VioletRed2   | 238 58 140  |
| VioletRed3   | 205 50 120  |
| VioletRed4   | 139 34 82   |
| wheat        | 245 222 179 |
| wheat1       | 255 231 186 |
| wheat2       | 238 216 174 |
| wheat3       | 205 186 150 |
| wheat4       | 139 126 102 |
| white        | 255 255 255 |
| white smoke  | 245 245 245 |
| WhiteSmoke   | 245 245 245 |
| yellow       | 255 255 0   |
| yellow green | 154 205 50  |
| yellow1      | 255 255 0   |
| yellow2      | 238 238 0   |
| yellow3      | 205 205 0   |
| yellow4      | 139 139 0   |
| YellowGreen  | 154 205 50  |

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