



Multihead on Sun Ray™ Appliances

A Technical White Paper

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Contents

Executive Summary 1

 Multihead Groups 2

 Multihead Screen Display 3

 Display Resolution 4

 Multihead Administration Tool 4

XINERAMA 7

Session Groups 8

 Multihead on a Single Appliance 9

Authentication Manager 10

Further Information 11

Multihead on Sun Ray™ Appliances

Executive Summary

The multihead feature on Sun Ray™ appliances allows users to control separate applications on multiple screens using a single keyboard and pointer device attached to the primary appliance. Users can also display and control a single application, such as a spreadsheet, on multiple screens. System administrators create multihead groups that may be accessed by users. A multihead group, consisting of two or more appliances controlled by one keyboard and mouse, may be composed of Sun Ray 1, Sun Ray 100, and Sun Ray 150 appliances.

Note – Multihead is not supported in a mixed version failover environment, such as Sun Ray enterprise server software 1.1 and Sun Ray enterprise server software 1.2. All servers in the failover group must be upgraded to Sun Ray server software 1.2.

Note – Multihead functionality requires LDAP replication in the failover group.

Note – For multihead to function properly, you must be in administered mode; therefore, you must run `utconfig` before you run `utmhconfig` and `utmhadm`.

By default, when the user logs into a multihead group, the user gets a multihead session using the number of screens available in that group. The resolution for the group is automatically set to the largest supported resolution of the primary appliance, which is the appliance that controls the other appliances in the group and

to which all peripherals are attached, by the auto-size feature. Auto-size may be turned off and the Xserver size may be changed using the `utxconfig` command; however, the user will experience the panning effect.

The user can explicitly choose not to use multiple screens per session by executing the `utxconfig -m off` command. The user can also choose a particular number of screens in a particular geometry by executing the `utxconfig -R geometry` command. Users can configure their sessions to start up to 16 screens on a single display. The user navigates among these screens using a pointer device, such as a mouse or trackball.

When the user moves the mouse past the edge between two screens, it moves from one screen to the next. The geometry of the multihead group determines which screen is displayed.

Multihead Groups

A multihead group is comprised of a set of associated Sun Ray appliances controlled by a primary appliance to which a keyboard and pointer device, such as a mouse, are connected. See FIGURE 1. This group, which can contain a maximum of 16 appliances, is connected to a single session.

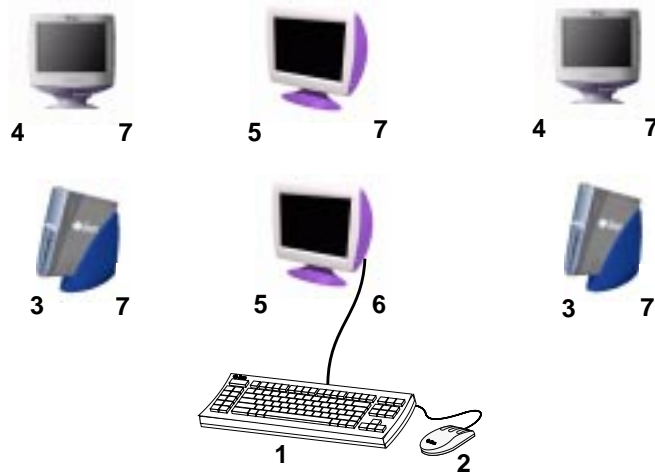


FIGURE 1 A Multihead Group

Legend:

1. Keyboard
2. Mouse
3. Sun Ray 1 appliances
4. Sun Ray 100 appliances
5. Sun Ray 150 appliances
6. Primary appliance
7. Secondary appliances

Unless XINERAMA is enabled (see “XINERAMA” on page 7), sessions may have a separate CDE toolbar (with separate workspaces) per screen. A window cannot be moved between screens.

The primary appliance hosts the input devices, such as a keyboard and a pointer device, and the USB devices associated with the session. The remaining appliances, called the secondaries, provide the additional displays; however, they are passive displays. All peripherals are attached to the primary appliance, and the group is controlled from the primary appliance.

A multihead group is defined by a row-major order list of appliance identifiers (left to right across row 1 followed by left to right across row 2 and so on), an identified primary appliance in that list, and a two-dimensional geometry (the number of columns and the number of rows). See FIGURE 1 for an example of a multihead group. The geometry of this group is 3 by 2 because there are three columns and two rows.

Multihead groups can be created by using a smart card to identify the terminals and using the `utmhconfig` GUI utility to create the group.

Multihead Screen Display

When the multihead feature is used, a small window indicating the current session on each screen is displayed with the current screen highlighted for easy identification. This window is automatically displayed for users during session creation. For example, the display in FIGURE 2 indicates that the user is on the second screen of a three-screen display.



FIGURE 2 The Multihead Screen Display

Display Resolution

Optimally, all the monitors in a workgroup have the same resolution to avoid panning problems; however, if the resolution differs among monitors within a workgroup, designate the lowest resolution monitor as the primary monitor and the others as the secondary monitors since the primary monitor sets the resolution for all secondary monitors.

The auto size feature sets the default resolution, which is the largest resolution supported by the primary appliance, automatically when the session is created. This resolution will be the optimum resolution for the multihead group. This feature can be turned off and on using the `utxconfig` command. The default geometry and screen order, which is the number of rows and columns in the multihead group, is also automatically set when the session is created. This feature can be turned off and on using the `utxconfig` command.

If auto-size is on when you create a session on a 2x1 multihead group, the result is a 2x1 session. If auto-size is off, the result is whatever size session you explicitly say. For instance, if auto-size is off and the geometry is 3x1, then even if you login to a 2x1 multihead group (or even a non-multihead, 1x1 terminal), you will get a 3x1 session with screen flipping. This might be useful if you know you are going to hot desk to a 3x1 multihead group in the future and want to take full advantage of it when you get there.

Note – If the resolutions of the monitors differ, you may have problems with unwanted movement on your screen called panning.

Multihead Administration Tool

The administration tool for the multihead feature displays the current multihead groups and allows you to create new groups.

▼ To Create a New Multihead Group

1. On the command-line interface, type:

```
# /opt/SUNWut/sbin/utmhconfig
```

2. On the initial screen select a group in the lefthand box.

The initial screen displays existing group names on the left side and group details—including group name and group geometry—on the right side. See FIGURE 3.

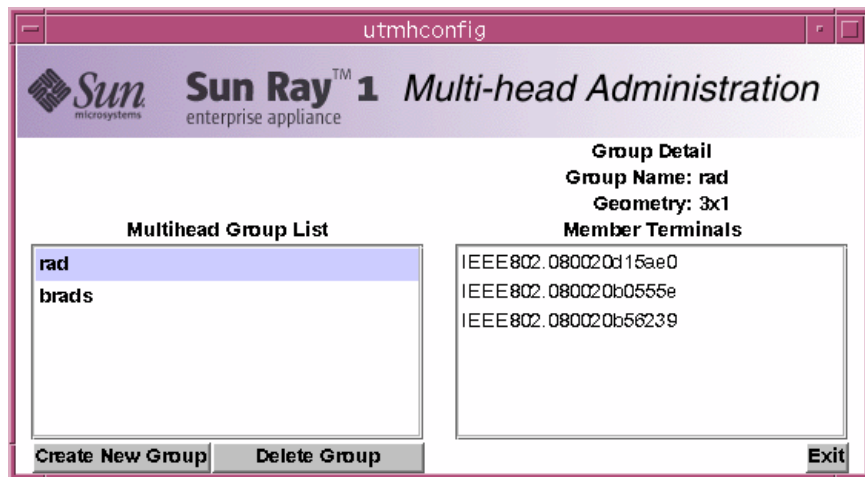


FIGURE 3 Multihead Group List With Group Detail

3. Click the Create New Group button.

The Create New Multiheaded Group popup is displayed. See FIGURE 4. The number of rows and the number of columns you enter are displayed as the group geometry when the group has been created. See FIGURE 3.

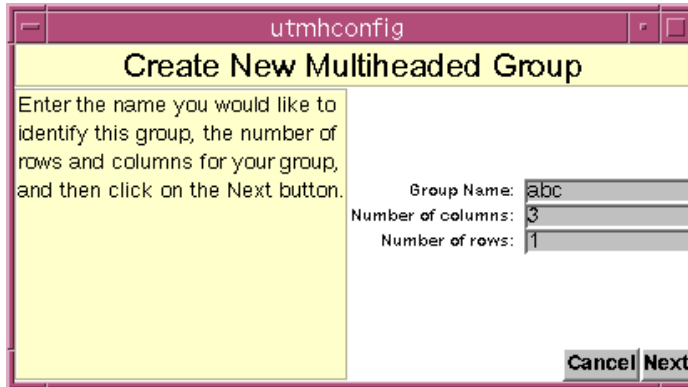


FIGURE 4 Create New Multiheaded Group Popup

4. Enter the information for the group.

Enter a name for the group and the number of rows and columns.

5. Click the Next button.

A third screen is displayed. See FIGURE 5.



FIGURE 5 Setup Display for the New Multihead Group

6. Select the appliances within the multihead group and insert a smart card in each Sun Ray appliance in turn to establish the order of the group.

The Finish button, which was previously grayed out, is now active. See FIGURE 6.

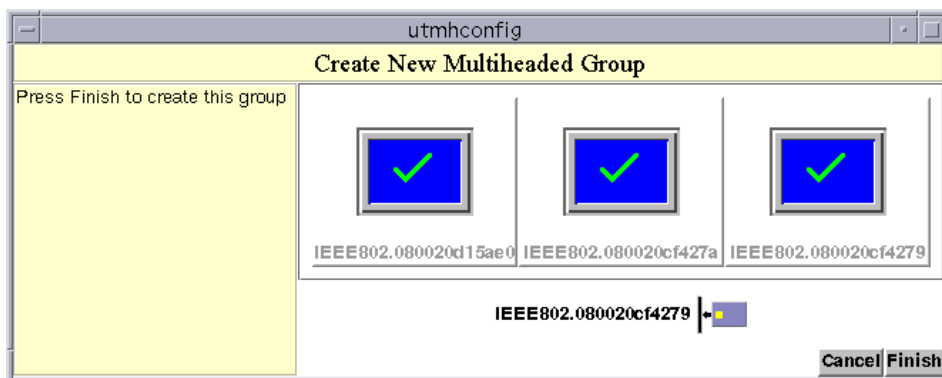


FIGURE 6 Completed Multihead Group List With Active Finish Button

7. Click the Finish button.

XINERAMA

The XINERAMA extension to X11 is one single large screen displayed across several monitors. With XINERAMA only one toolbar is displayed, and a window can be moved smoothly from one part of the screen to the next. XINERAMA is supported on both the Solaris 7 and Solaris 8 operating environments.

A single CDE toolbar (and set of workspaces) manages the configured monitors. A window can span monitors since they are still within the same screen. This includes the CDE toolbar itself.

Note – XINERAMA consumes more CPU, memory, and network bandwidth, and perturbs the scaling calculations.

Users enable or disable XINERAMA as part of their X preferences. The `utxconfig` command handles this on an individual token basis.

The XINERAMA feature is invoked using the following command:

```
% /opt/SUNWut/bin/utxconfig -x on
```

Since this is a toggle, type `off` to turn the feature off.

Session Groups

The user has the option of associating more than one screen with a session and navigating among the screens using a pointer device, such as a mouse or trackball. If the user's session is connected to a multihead group and that group can support all of the session's screens, then the user can view all screens simultaneously.

The session group, which is associated with a multihead group, checks to see if the group's multihead layout accommodates all of its screens; that is, whether there are enough displays in the group to show one screen per display. If so, then each of the screens is connected to an independent monitor in the group. If there are more monitors in rows or columns in the multihead group than in the session group, then these are not used and display a blank purple screen.

In FIGURE 7 the multihead group contains five appliances, but there are only three appliances in the session group. The multihead group is displayed on the first three appliances. The next two appliances display a blank purple screen.

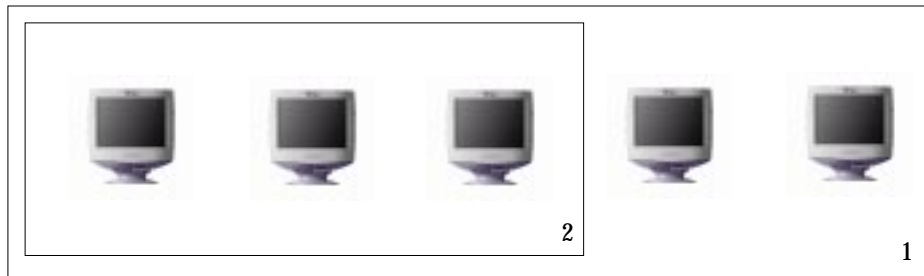


FIGURE 7 Fewer Session Group Appliances

Legend:

1. Multihead Group
2. Session Group

If there are fewer monitors in rows or columns in the multihead group than in the session, the session group is only mapped to the primary appliance. In FIGURE 8 the multihead group contains two appliances, but the session group contains three appliances; therefore, all screens are displayed on the primary appliance only. The other four screens are blank purple.

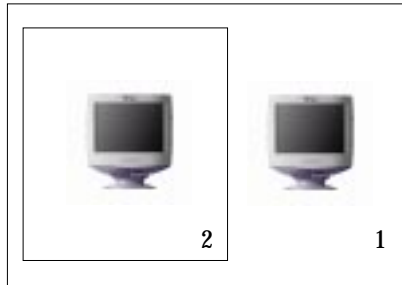


FIGURE 8 Fewer Multihead Group Appliances

Legend:

1. Multihead Group
2. Session Group

Multihead on a Single Appliance

If you hot desk from a multihead group to an appliance that is not part of a multihead group—that is, an appliance with a single head—all the screens created in the original multihead group can be viewed on the single screen or head, using a pointer device, such as a mouse, to pan to each screen in turn on the appliance. This is called screen flipping.

However, if you disconnect the secondary appliances, the screens are not displayed on the single primary appliance. The primary appliance behaves as though it is still part of the multihead group, and the mouse seems to get lost when it goes to the disconnected secondary appliance. To recover from this situation, you can either reconnect the missing appliance or delete the multihead group using the `utmhconfig` or `utmhadm` commands, or you can delete the multihead group, replace the missing appliance, and create a new multihead group that incorporates the replacement appliance.

Authentication Manager

The TerminalGroup policy module extends the Authentication Manager for support of multihead groups. The Authentication Manager queries its appliance group database for an identifier. If the identifier is not found, then the module does not acknowledge its existence.

If the appliance is the primary, then one of a number of things can occur. If a session exists on the same server, then a permit is issued to the Session Manager containing the appliance's IP address or port. If a session exists on another server (determined through a group manager lookup), then the appliance is redirected to the correct server. If no session exists, then the normal steps for creating a session occur, which might include redirecting the session to another, less loaded server. See FIGURE 9.

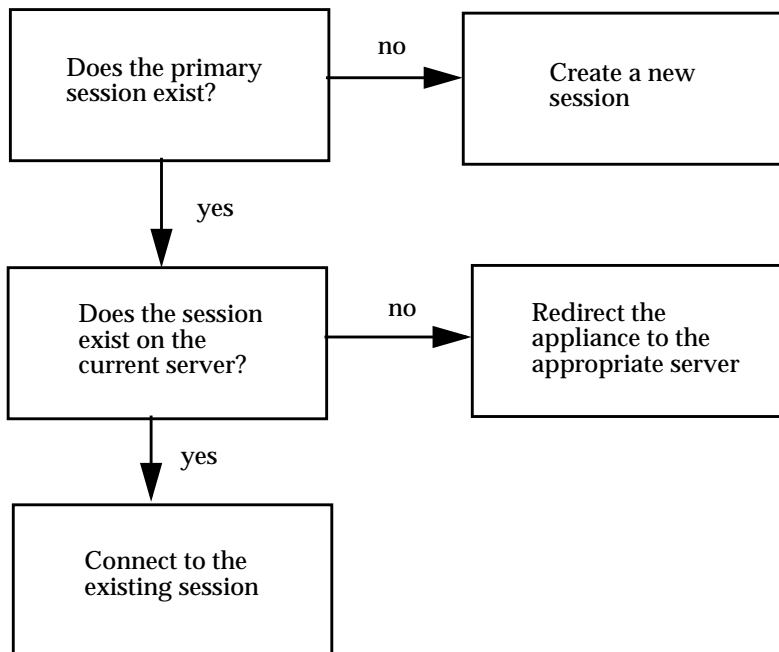


FIGURE 9 Authentication Manager Flowchart for the Primary Appliance

If the connecting appliance is a secondary appliance and if a session on the group's primary exists on this server, a new permit message containing the primary and secondary IP address or port is issued to the Session Manager. If the session is found on another server, then the appliance is redirected as before. See FIGURE 10.

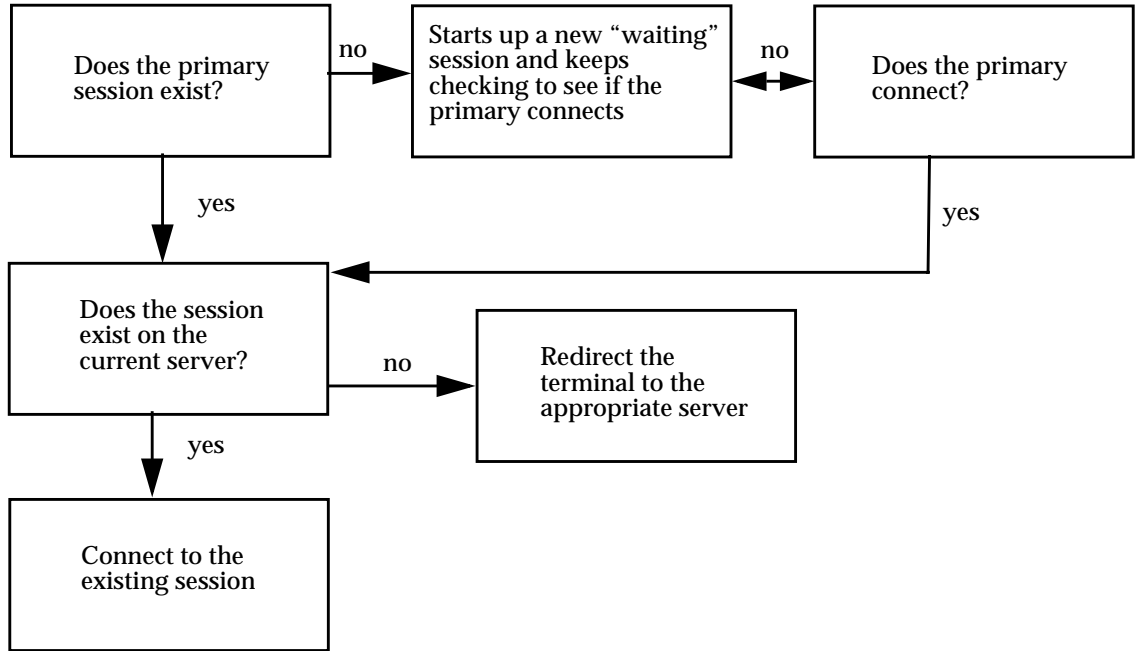


FIGURE 10 Flowchart for the Secondary Appliance

When a secondary connection cannot find a primary session on the first attempt, a temporary icon session is created. Thereafter, this session continuously monitors the Authentication Manager for a connection from the primary session. When the connection is made, the temporary session is removed and the secondary joins the primary session.

Further Information

Further information may be found on the website:

<http://www.sun.com/sunray>



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