

**OSF/Motif™**  
**Application Environment Specification**



# OSF/Motif™

## Application Environment Specification

069-100326-00

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## Preface

Part of OSF's charter is to foster the development of software that will run without modification on a variety of hardware platforms. This manual specifies the interfaces that support the development of portable programs for OSF/Motif platforms.

### Audience

This document is written for:

- Software engineers developing AES-compliant applications to run on AES-compliant implementations.
- Software engineers developing AES-compliant implementations on which AES-compliant applications can run.
- Organizations (e.g., standards-setting bodies) for whom the AES (or some part of it) is an appropriate part of the formal, de jure process.

### Contents

This document has two chapters:

- *Chapter 1* introduces the AES, providing the general AES definition, and the general rationale for inclusion and specification of interfaces in the AES.
- *Chapter 2* lists and describes the AES interfaces.

The AES interfaces are a subset of the OSF/Motif interfaces. They are documented in the *OSF/Motif Programmer's Reference* (069-100320). They are also documented online, in MAN page format.

### Typographical Conventions

This volume uses the following typographical conventions:

- **Boldfaced** strings represent literals; type them exactly as they appear.
- *Italicized* strings represent variables (for example, function or macro arguments).
- Ellipses (...) indicate that additional arguments are optional.





# Chapter 1

## General Introduction to the Application Environment Specification

In May, 1988, the Open Software Foundation published a base version of the AES. Since then, OSF staff members have refined the definition of the AES and streamlined its development process.

This document provides a definition of the AES, and a detailed description of the AES development process. This document also describes the relationship of the AES to:

- Formal (de jure) standards and specifications.
- Implementations; for example, user environments like OSF/Motif.
- Portable applications software.

### Content

An applications environment is a set of program and user-level interfaces. These include system calls, library routines, and user commands. The interfaces specified in the AES also have the following characteristics:

- They can be implemented on a wide variety of hardware platforms.
- They support hardware-independent applications.
- They are stable, reliable, and in widespread use.

We call AES-specified program and user-level interfaces *portability services*, because they provide support for portable (hardware-independent) applications.

**Note:** OSF will define, document, and support internal (kernel) interfaces, but not as part of the AES. The AES specifies only application-level portability services (as previously defined).

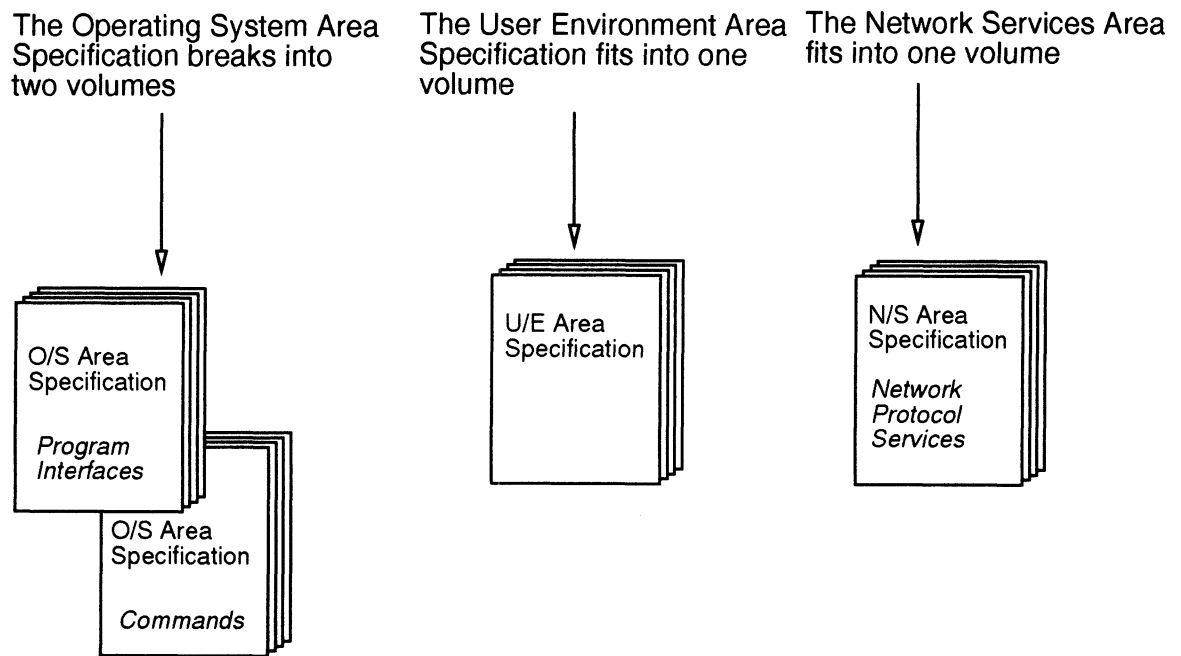
### Organization

The AES is an evolving set of *area specifications*. Each area specification describes portability services from one *functional area* of the applications environment. OSF has identified the following functional areas:

- Operating System.
- Network Services.
- User Interface Services.
- Graphics Services.
- Database Management Services.
- Programming Languages (BASIC, FORTRAN, Pascal, C, COBOL, Ada, and LISP).

Currently, the AES provides area specifications for portability services in three functional areas. The *AES/Operating System Area Specification* describes the portability services that an AES-compliant operating system must provide, and consists of two documents (describing programming interfaces and commands, respectively). The *AES/Network Services Area Specification* describes protocol-specific network services. The *AES/User Environment Area Specification* describes the portability services that an AES-compliant user interface must provide, and consists of one document (describing user interface and window management services).

Figure 1 shows the organization of the entire (current) AES, including the *AES/Operating System*, *AES/Network Services*, and *AES/User Environment Area Specifications*.



**Figure 1.** The Current Organization of AES Documents

## Purpose

The composite AES defines the stable, reliable, application-level services in several functional areas. Systems sellers who comply with the AES know exactly what services they must provide, and how these services must behave. Systems buyers who look for AES compliance know unequivocally the services on which they will be able to rely. By creating and maintaining the AES, OSF fosters a consistent applications environment across different hardware platforms.

## **The Meaning of AES Compliance**

Implementations and applications that comply with the AES do so on the basis of area functionality.

### **AES Compliance for Implementations**

If an implementation claims AES compliance in a functional area, it must:

- Provide every interface specified by the AES for that functional area.
- Implement each interface exactly as specified by the AES for that functional area.
- Pass the OSF-supplied validation suites provided for that functional area.

AES area-compliant implementations are not limited to providing only AES-specified services; they may also provide non-AES specified services.

An implementation that complies with one functional area does not need to provide services from any other. However, if services from more than one functional area are provided, they must be AES-compliant. For example, if the implementation provides COBOL, the COBOL provided must conform to ANSI X3.32-1985, FIPS 021-2. If language bindings for COBOL are included in a functional area of the AES, these must be provided, as well.

### **AES Compliance for Applications**

If an application claims AES compliance in a functional area, it must use only the services specified by the AES for that functional area.

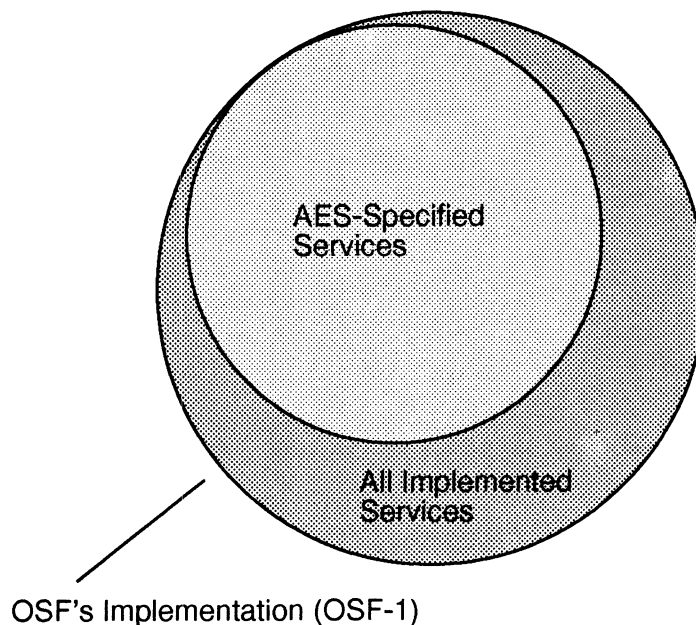
## **How the AES Evolves**

For each functional area, OSF produces one or more AES area specification drafts for its membership to review. After incorporating member review comments, OSF produces a final AES area specification. A final AES area specification includes the interface definitions for a stable set of portability services in one functional area of the OSF-supported applications environment.

## OSF's Implementations and the AES

Membership review of each draft AES affects OSF's own implementation process. OSF releases vendor-neutral implementations (source code, also called software offerings). Each offering conforms to the final AES area specification in a corresponding functional area. Currently, OSF plans two software offerings: one in the User Environment (UE) functional area, and one in the Operating System (OS) functional area (to include network services).

OSF's implementations *always* include the portability services defined in the AES. They may also include services not specified in the AES. Some of these services (for example, newly developed ones) may be candidates for inclusion into a subsequent version of the AES, provided they meet the appropriate criteria (described previously). Figure 2 shows how AES-specified services are a subset of the services provided in OSF's implementation (OSF-1).



**Figure 2.** Services within OSF's Implementation (OSF-1)

OSF's implementations provide practical, vendor-neutral experience with hardware-independent services. This experience provides a feedback mechanism that enables the AES to expand more quickly than a standards document, without compromising the vendor neutrality of the AES.

## Document Control and the AES

To prevent confusion between the AES and numbered releases of software offerings, OSF labels the AES for each functional area with a *Revision Letter*. For instance, the first version of the Operating System software offering will be accompanied by AES/OS Revision A. As the collection of software offerings

grows, OSF may group the existing revisions into an *AES Level*. For example, an AES Level might include AES/UE Revision B, AES/OS Revision A, and so on.

Each revision of an AES includes, for reference, the complete list of applications environment standards and specifications (the standards and specifications included in the applications environment).

## The System Service Outline

If all of the services for a functional area are already specified in industry standards or other specification documents, the draft AES for that functional area may provide only a System Service Outline. The System Service Outline lists each of the proposed services, and includes the following information for each service:

- The level of support OSF proposes to give the service.
- The current standards and specifications with which the service complies.

Alternately, the SSO can supply a preview of services that OSF will provide in the final AES. Every AES System Service Outline contains a table like one of the following (called the System Service Outline Table):

Name	AES Level	XPG3	POSIX 1003.1	ANSI C X3J11	SVID3	SVID2	BSD 4.3
call_name	full-use	x	-	-	x	x	x
call_name	trial-use	x	-	x	x	x	-

Service Name	Service Type	AES Level
service_name	function	proposed-for-full-use
service_name	command	full-use

Subsequent documents typically contain more complete documentation (including manual ("man") pages or pointers to other information, and conceptual descriptions) for each service. As mentioned previously, final AES documents reflect the results of the membership review.

## The Membership Review Cycle

In general, the membership review cycle proceeds as follows:

1. OSF prepares a Draft AES or a System Service Outline for a functional area, and circulates it to the membership.
2. Members comment (preferably electronically) using a prescribed "comment template".
3. OSF responds to members' comments electronically, or in a discussion that takes place at a Members' Meeting.

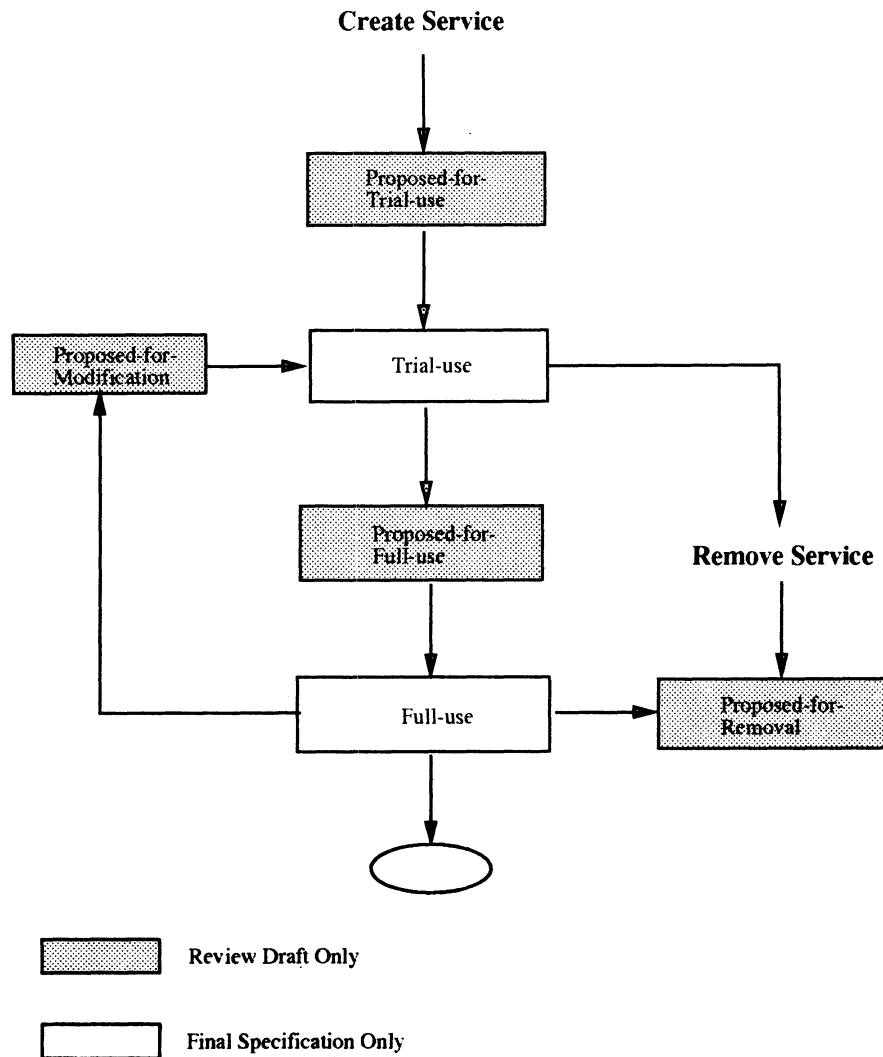
OSF considers all review comments during the development of AES documents, and software offerings. Because OSF is not a standards organization, however, the review process is not a voting process, nor must OSF wait for a majority opinion among the membership before proceeding with software development.

## Levels of Support and the AES

When OSF first proposes to add a service to an AES, we designate the service as "proposed-for-trial-use" in the appropriate draft specification. If the service gets membership approval during the draft (review) cycle, we designate it "trial-use" in the final specification.

OSF may choose to upgrade a service's support level. When this happens, we revise a specification, and designate the service as "proposed-for-full-use". A draft of each revised specification undergoes review. Upon approval, we designate the service "full-use" in the final (revised) specification.

OSF will neither remove nor modify a full-use service without first designating it in the appropriate draft specification as "proposed-for-removal" or "proposed-for-modification". Once the membership has approved changes in a service's status, OSF disseminates a final (revised) specification. Figure 3 shows how AES levels of support work.



**Figure 3. AES Levels of Support**

## Chapter 2

# The AES Interface Routines

This chapter describes the AES interfaces in relation to one another, and to the entire collection of OSF/Motif programming routines. For detailed information about the interfaces, see the *OSF/Motif Programmer's Reference* and the *OSF/Motif Programmer's Guide*.

### Excluded Functions

Six categories of OSF/Motif functions are excluded from the AES. These are listed and briefly described below.

#### **uil and Mrm functions**

Preliminary feedback from builders of interactive design tools and user interface management systems indicate that as is, uil does not completely support their needs. While we hope and expect that future changes will be upwards compatible, this cannot be guaranteed at this time. We are still evaluating whether or not some uil interfaces are stable enough for inclusion in the AES.

#### **Functions supporting WM\_PROTOCOLS: XmActiveWMProtocol, XmAddWMProtocolCallbacks, XmWMAddProtocols, XmDeactivateWMProtocol, XmRemoveWMProtocolCallbacks, XmRemoveWMProtocols, XmSetWMProtocolHooks**

Support for WM\_PROTOCOLS is not being considered for the X Consortium's R4 Ininsics, but may be considered in R5. When it is, Intrinsic support could make these routines obsolete.

#### **Functions supporting other protocols: XmActiveProtocol, XmAddProtocolCallbacks, XmAddProtocols, XmDeactivateProtocol, XmRemoveProtocolCallbacks, XmRemoveProtocols, XmSetProtocolHooks**

These functions are used to support application writers who add entries to the system menu. The functions as provided are also meant to support the WM\_PROTOCOL functions as well. Decisions about AES inclusion will depend upon the resolution of WM\_PROTOCOL functions.

#### **String and FontList functions and the resource XmNstringDirection**

XmString and its associated functions support mixed character set strings. At present, they are used for static strings only and do not incorporate information about the language which character segments represent. It is hoped that the interfaces will prove adequate for support of editable mixed-text strings with language identification, but until that is demonstrated, these functions are not part of the AES. Functions that require string and fontlist functions, resources and types are still available. The function of those elements are just not defined in this AES.

#### **Convert functions: XmConvertUnits, XmCvtStringToUnitType**

These support the Motif resolution independence model. This model has not been field tested enough for inclusion in the AES at this time.

#### **The XmNdoubleClickInterval resource**

This resource is used in XmList and will be replaced by an application resource in the R4 intrinsics.

### System Service Outline

Table 1 lists all the services considered for inclusion in the AES. (These services are documented in the MAN pages and in the *OSF/Motif Programmer's Reference*.) The first column is the name of the service. The table is arranged alphabetically by this column. The second column is the type of the service. The

type is either widget, function, command, or file format. The third column is the proposed AES support level. All the services in this table are proposed as either full-use or excluded.

**TABLE 1. System Service Outline**

<b>Service Name</b>	<b>Service Type</b>	<b>AES Level</b>
ApplicationShell	widget	full-use
Composite	widget	full-use
Constraint	widget	full-use
Core	widget	full-use
MmmCloseHierarchy	function	excluded
MmmFetchColorLiteral	function	excluded
MmmFetchIconLiteral	function	excluded
MmmFetchInterfaceModule	function	excluded
MmmFetchLiteral	function	excluded
MmmFetchSetValues	function	excluded
MmmFetchWidget	function	excluded
MmmFetchWidgetOverride	function	excluded
MmmInitialize	function	excluded
MmmOpenHierarchy	function	excluded
MmmRegisterClass	function	excluded
MmmRegisterNames	function	excluded
Object	widget	full-use
OverrideShell	widget	full-use
RectObj	widget	full-use
Shell	widget	full-use
TopLevelShell	widget	full-use
TransientShell	widget	full-use
Uil	function	excluded
UilDumpSymbolTree	function	excluded
VendorShell	widget	full-use
WMShell	widget	full-use
WindowObject	widget	full-use
XmActivateProtocol	function	excluded
XmActivateWMProtocol	function	excluded
XmAddProtocolCallbacks	function	excluded
XmAddProtocols	function	excluded
XmAddTabGroup	function	full-use
XmAddWMProtocolCallbacks	function	excluded
XmAddWMProtocols	function	excluded
XmArrowButton	widget	full-use
XmArrowButtonGadget	widget	full-use
XmBulletinBoard	widget	full-use



<b>Service Name</b>	<b>Service Type</b>	<b>AES Level</b>
XmCascadeButton	widget	full-use
XmCascadeButtonGadget	widget	full-use
XmCascadeButtonHighlight	function	full-use
XmClipboardCancelCopy	function	full-use
XmClipboardCopy	function	full-use
XmClipboardCopyByName	function	full-use
XmClipboardEndCopy	function	full-use
XmClipboardEndRetrieve	function	full-use
XmClipboardInquireCount	function	full-use
XmClipboardInquireFormat	function	full-use
XmClipboardInquireLength	function	full-use
XmClipboardInquirePendingItems	function	full-use
XmClipboardLock	function	full-use
XmClipboardRegisterFormat	function	full-use
XmClipboardRetrieve	function	full-use
XmClipboardStartCopy	function	full-use
XmClipboardStartRetrieve	function	full-use
XmClipboardUndoCopy	function	full-use
XmClipboardUnlock	function	full-use
XmClipboardWithdrawFormat	function	full-use
XmCommand	widget	full-use
XmCommandAppendValue	function	full-use
XmCommandError	function	full-use
XmCommandGetChild	function	full-use
XmCommandSetValue	function	full-use
XmConvertUnits	function	excluded
XmCreateArrowButton	function	full-use
XmCreateArrowButtonGadget	function	full-use
XmCreateBulletinBoard	function	full-use
XmCreateBulletinBoardDialog	function	full-use
XmCreateCascadeButton	function	full-use
XmCreateCascadeButtonGadget	function	full-use
XmCreateCommand	function	full-use
XmCreateDialogShell	function	full-use
XmCreateDrawingArea	function	full-use
XmCreateDrawnButton	function	full-use
XmCreateErrorDialog	function	full-use
XmCreateFileSelectionBox	function	full-use
XmCreateFileSelectionDialog	function	full-use
XmCreateForm	function	full-use
XmCreateFormDialog	function	full-use
XmCreateFrame	function	full-use
XmCreateInformationDialog	function	full-use
XmCreateLabel	function	full-use

<b>Service Name</b>	<b>Service Type</b>	<b>AES Level</b>
XmCreateLabelGadget	function	full-use
XmCreateList	function	full-use
XmCreateMainWindow	function	full-use
XmCreateMenuBar	function	full-use
XmCreateMenuShell	function	full-use
XmCreateMessageBox	function	full-use
XmCreateMessageDialog	function	full-use
XmCreateOptionMenu	function	full-use
XmCreatePanedWindow	function	full-use
XmCreatePopupMenu	function	full-use
XmCreatePromptDialog	function	full-use
XmCreatePulldownMenu	function	full-use
XmCreatePushButton	function	full-use
XmCreatePushButtonGadget	function	full-use
XmCreateQuestionDialog	function	full-use
XmCreateRadioBox	function	full-use
XmCreateRowColumn	function	full-use
XmCreateScale	function	full-use
XmCreateScrollBar	function	full-use
XmCreateScrolledList	function	full-use
XmCreateScrolledText	function	full-use
XmCreateScrolledWindow	function	full-use
XmCreateSelectionBox	function	full-use
XmCreateSelectionDialog	function	full-use
XmCreateSeparator	function	full-use
XmCreateSeparatorGadget	function	full-use
XmCreateText	function	full-use
XmCreateToggleButton	function	full-use
XmCreateToggleButtonGadget	function	full-use
XmCreateWarningDialog	function	full-use
XmCreateWorkingDialog	function	full-use
XmCvtStringToUnitType	function	excluded
XmDeactivateProtocol	function	excluded
XmDeactivateWMProtocol	function	excluded
XmDestroyPixmap	function	full-use
XmDialogShell	widget	full-use
XmDrawingArea	widget	full-use
XmDrawnButton	widget	full-use
XmFileSelectionBox	widget	full-use
XmFileSelectionBoxGetChild	function	full-use
XmFileSelectionDoSearch	function	full-use
XmFontListAdd	function	excluded
XmFontListCreate	function	excluded
XmFontListFree	function	excluded

<b>Service Name</b>	<b>Service Type</b>	<b>AES Level</b>
XmForm	widget	full-use
XmFrame	widget	full-use
XmGadget	widget	full-use
XmGetAtomName	function	full-use
XmGetMenuCursor	function	full-use
XmGetPixmap	function	full-use
XmInstallImage	function	full-use
XmInternAtom	function	full-use
XmIsMotifWMRunning	function	full-use
XmLabel	widget	full-use
XmLabelGadget	widget	full-use
XmList	widget	full-use
XmListAddItem	function	full-use
XmListAddItemUnselected	function	full-use
XmListDeleteItem	function	full-use
XmListDeletePos	function	full-use
XmListDeselectAllItems	function	full-use
XmListDeselectItem	function	full-use
XmListDeselectPos	function	full-use
XmListItemExists	function	full-use
XmListSelectItem	function	full-use
XmListSelectPos	function	full-use
XmListSetBottomItem	function	full-use
XmListSetBottomPos	function	full-use
XmListSetHorizPos	function	full-use
XmListSetItem	function	full-use
XmListSetPos	function	full-use
XmMainWindow	widget	full-use
XmMainWindowSep1	function	full-use
XmMainWindowSep2	function	full-use
XmMainWindowSetAreas	function	full-use
XmManager	widget	full-use
XmMenuPosition	function	full-use
XmMenuShell	widget	full-use
XmMessageBox	widget	full-use
XmMessageBoxGetChild	function	full-use
XmOptionButtonWidget	function	full-use
XmOptionLabelWidget	function	full-use
XmPanedWindow	widget	full-use
XmPrimitive	widget	full-use
XmPushButton	widget	full-use
XmPushButtonGadget	widget	full-use
XmRemoveProtocolCallbacks	function	excluded
XmRemoveProtocols	function	excluded

<b>Service Name</b>	<b>Service Type</b>	<b>AES Level</b>
XmRemoveTabGroup	function	full-use
XmRemoveWMProtocolCallbacks	function	excluded
XmRemoveWMProtocols	function	excluded
XmResolvePartOffsets	function	full-use
XmRowColumn	widget	full-use
XmScale	widget	full-use
XmScaleGetValue	function	full-use
XmScaleSetValue	function	full-use
XmScrollBar	widget	full-use
XmScrollBarGetValues	function	full-use
XmScrollBarSetValues	function	full-use
XmScrolledWindow	widget	full-use
XmScrolledWindowSetAreas	function	full-use
XmSelectionBox	widget	full-use
XmSelectionBoxGetChild	function	full-use
XmSeparator	widget	full-use
XmSeparatorGadget	widget	full-use
XmSetFontUnit	function	excluded
XmSetMenuCursor	function	full-use
XmSetProtocolHooks	function	excluded
XmSetWMProtocolHooks	function	excluded
XmStringBaseline	function	excluded
XmStringByteCompare	function	excluded
XmStringCompare	function	excluded
XmStringConcat	function	excluded
XmStringCopy	function	excluded
XmStringCreate	function	excluded
XmStringCreateLtoR	function	excluded
XmStringDirectionCreate	function	excluded
XmStringDraw	function	excluded
XmStringDrawImage	function	excluded
XmStringDrawUnderline	function	excluded
XmStringEmpty	function	excluded
XmStringExtent	function	excluded
XmStringFree	function	excluded
XmStringFreeContext	function	excluded
XmStringGetLtoR	function	excluded
XmStringGetComponent	function	excluded
XmStringGetNextSegment	function	excluded
XmStringHeight	function	excluded
XmStringInitContext	function	excluded
XmStringLength	function	excluded
XmStringLineCount	function	excluded
XmStringNConcat	function	excluded

Service Name	Service Type	AES Level
XmStringNCopy	function	excluded
XmStringPeekNextComponent	function	excluded
XmStringSegmentCreate	function	excluded
XmStringSeparatorCreate	function	excluded
XmStringWidth	function	excluded
XmText	widget	full-use
XmTextClearSelection	function	full-use
XmTextGetEditable	function	full-use
XmTextGetMaxLength	function	full-use
XmTextGetSelection	function	full-use
XmTextGetString	function	full-use
XmTextReplace	function	full-use
XmTextSetEditable	function	full-use
XmTextSetMaxLength	function	full-use
XmTextSetSelection	function	full-use
XmTextSetString	function	full-use
XmToggleButton	widget	full-use
XmToggleButtonGadget	widget	full-use
XmToggleButtonGadgetGetState	function	full-use
XmToggleButtonGadgetSetState	function	full-use
XmToggleButtonGetState	function	full-use
XmToggleButtonSetState	function	full-use
XmUninstallImage	function	full-use
XmUpdateDisplay	function	full-use
mwm	command	full-use
uil	command	excluded

## AES Services By Type and Function

The types of service provided by OSF/Motif are:

- Window management
- Widget and widget function
- Toolkit functions
- User interface language (uil)

One window manager, mwm, is supplied. Its service type is command, and its AES level is full-use. Tables 2 through 4 list the services of the widget, toolkit, and uil type.

## Widgets and Widget Functions

Table 2 below organizes widgets by hierarchy. Position in the hierarchy is shown by the indentation of the service name. The functions for each widget immediately follow the widget.

Service Name	Service Type	AES Level
<b>Core</b>	widget	full-use
<b>Object</b>	widget	full-use
<b>RectObj</b>	widget	full-use
<b>WindowObj</b>	widget	full-use
<b>XmPrimitive</b>	widget	full-use
<b>XmArrowButton</b>	widget	full-use
XmCreateArrowButton	function	full-use
<b>XmLabel</b>	widget	full-use
XmCreateLabel	function	full-use
<b>XmCascadeButton</b>	widget	full-use
XmCreateCascadeButton	function	full-use
XmCascadeButtonHighlight	function	full-use
<b>XmDrawnButton</b>	widget	full-use
XmCreateDrawnButton	function	full-use
<b>XmPushButton</b>	widget	full-use
XmCreatePushButton	function	full-use
<b>XmToggleButton</b>	widget	full-use
XmCreateToggleButton	function	full-use
XmToggleButtonGetState	function	full-use
XmToggleButtonSetState	function	full-use
<b>XmList</b>	widget	full-use
XmCreateList	function	full-use
XmListAddItem	function	full-use
XmListAddItemUnselected	function	full-use
XmListDeleteItem	function	full-use
XmListDeletePos	function	full-use
XmListDeselectAllItems	function	full-use
XmListDeselectItem	function	full-use
XmListDeselectPos	function	full-use
XmListItemExists	function	full-use
XmListSelectItem	function	full-use
XmListSelectPos	function	full-use
XmListSetBottomItem	function	full-use
XmListSetBottomPos	function	full-use
XmListSetHorizPos	function	full-use
XmListSetItem	function	full-use
XmListSetPos	function	full-use
<b>XmScrollBar</b>	widget	full-use
XmCreateScrollBar	function	full-use
XmScrollBarGetValues	function	full-use
XmScrollBarSetValues	function	full-use
<b>XmSeparator</b>	widget	full-use
XmCreateSeparator	function	full-use
<b>XmText</b>	widget	full-use

Service Name	Service Type	AES Level
XmCreateText	function	full-use
XmTextClearSelection	function	full-use
XmTextGetEditable	function	full-use
XmTextGetMaxLength	function	full-use
XmTextGetSelection	function	full-use
XmTextGetString	function	full-use
XmTextReplace	function	full-use
XmTextSetEditable	function	full-use
XmTextSetMaxLength	function	full-use
XmTextSetSelection	function	full-use
XmTextSetString	function	full-use
<b>Composite</b>	widget	full-use
<b>Shell</b>	widget	full-use
<b>OverrideShell</b>	widget	full-use
<b>XmMenuShell</b>	widget	full-use
XmCreateMenuShell	function	full-use
<b>WMShell</b>	widget	full-use
<b>VendorShell</b>	widget	full-use
XmGetAtomName	function	full-use
XmInternAtom	function	full-use
<b>TopLevelShell</b>	widget	full-use
<b>ApplicationShell</b>	widget	full-use
<b>TransientShell</b>	widget	full-use
<b>XmDialogShell</b>	widget	full-use
XmCreateDialogShell	function	full-use
<b>Constraint</b>	widget	full-use
<b>XmManager</b>	widget	full-use
<b>XmBulletinBoard</b>	widget	full-use
XmCreateBulletinBoard	function	full-use
XmCreateBulletinBoardDialog	function	full-use
<b>XmForm</b>	widget	full-use
XmCreateForm	function	full-use
XmCreateFormDialog	function	full-use
<b>XmMessageBox</b>	widget	full-use
XmCreateMessageBox	function	full-use
XmCreateErrorDialog	function	full-use
XmCreateInformationDialog	function	full-use
XmCreateMessageDialog	function	full-use
XmCreateQuestionDialog	function	full-use
XmCreateWarningDialog	function	full-use
XmCreateWorkingDialog	function	full-use
XmMessageBoxGetChild	function	full-use
<b>XmSelectionBox</b>	widget	full-use
XmCreateSelectionBox	function	full-use

Service Name	Service Type	AES Level
XmCreatePromptDialog	function	full-use
XmCreateSelectionDialog	function	full-use
XmSelectionBoxGetChild	function	full-use
<b>XmCommand</b>	widget	full-use
XmCreateCommand	function	full-use
XmCommandAppendValue	function	full-use
XmCommandError	function	full-use
XmCommandGetChild	function	full-use
XmCommandSetValue	function	full-use
<b>XmFileSelectionBox</b>	widget	full-use
XmCreateFileSelectionBox	function	full-use
XmCreateFileSelectionDialog	function	full-use
XmFileSelectionBoxGetChild	function	full-use
XmFileSelectionDoSearch	function	full-use
<b>XmDrawingArea</b>	widget	full-use
XmCreateDrawingArea	function	full-use
<b>XmFrame</b>	widget	full-use
XmCreateFrame	function	full-use
<b>XmPanedWindow</b>	widget	full-use
XmCreatePanedWindow	function	full-use
<b>XmRowColumn</b>	widget	full-use
XmCreateRowColumn	function	full-use
XmCreateMenuBar	function	full-use
XmCreateOptionsMenu	function	full-use
XmCreatePopupMenu	function	full-use
XmCreatePulldownMenu	function	full-use
XmCreateRadioBox	function	full-use
XmGetMenuCursor	function	full-use
XmMenuPosition	function	full-use
XmOptionButtonWidget	function	full-use
XmOptionLabelWidget	function	full-use
XmSetMenuCursor	function	full-use
<b>XmScale</b>	widget	full-use
XmCreateScale	function	full-use
XmScaleGetValue	function	full-use
XmScaleSetValue	function	full-use
<b>XmScrolledWindow</b>	widget	full-use
XmCreateScrolledWindow	function	full-use
XmCreateScrolledList	function	full-use
XmCreateScrolledText	function	full-use
XmScrolledWindowSetAreas	function	full-use
<b>XmMainWindow</b>	widget	full-use
XmCreateMainWindow	function	full-use
XmMainWindowSep1	function	full-use



Service Name	Service Type	AES Level
XmMainWindowSep2	function	full-use
XmMainWindowSetAreas	function	full-use
<b>XmGadget</b>	widget	full-use
<b>XmArrowButtonGadget</b>	widget	full-use
XmCreateArrowButtonGadget	function	full-use
<b>XmLabelGadget</b>	widget	full-use
XmCreateLabelGadget	function	full-use
<b>XmCascadeButtonGadget</b>	widget	full-use
XmCreateCascadeButtonGadget	function	full-use
<b>XmPushButtonGadget</b>	widget	full-use
XmCreatePushButtonGadget	function	full-use
<b>XmToggleButtonGadget</b>	widget	full-use
XmCreateToggleButtonGadget	function	full-use
XmToggleButtonGadgetGetState	function	full-use
XmToggleButtonGadgetSetState	function	full-use
<b>XmSeparatorGadget</b>	widget	full-use
XmCreateSeparatorGadget	function	full-use

TABLE 2. Widgets and widget functions

## Toolkit Functions

Table 3 below lists the toolkit functions.

Service Name	Service Type	AES Level
XmActivateProtocol	function	excluded
XmActivateWMProtocol	function	excluded
XmAddProtocolCallbacks	function	excluded
XmAddProtocols	function	excluded
XmAddTabGroup	function	full-use
XmAddWMProtocolCallbacks	function	excluded
XmAddWMProtocols	function	excluded
XmClipboardCancelCopy	function	full-use
XmClipboardCopy	function	full-use
XmClipboardCopyByName	function	full-use
XmClipboardEndCopy	function	full-use
XmClipboardEndRetrieve	function	full-use
XmClipboardInquireCount	function	full-use
XmClipboardInquireFormat	function	full-use
XmClipboardInquireLength	function	full-use
XmClipboardInquirePendingItems	function	full-use
XmClipboardLock	function	full-use
XmClipboardRegisterFormat	function	full-use
XmClipboardRetrieve	function	full-use

<b>Service Name</b>	<b>Service Type</b>	<b>AES Level</b>
XmClipboardStartCopy	function	full-use
XmClipboardStartRetrieve	function	full-use
XmClipboardUndoCopy	function	full-use
XmClipboardUnlock	function	full-use
XmClipboardWithdrawFormat	function	full-use
XmConvertUnits	function	excluded
XmCvtStringToUnitType	function	excluded
XmDeactivateProtocol	function	excluded
XmDeactivateWMProtocol	function	excluded
XmDestroyPixmap	function	full-use
XmFontListAdd	function	excluded
XmFontListCreate	function	excluded
XmFontListFree	function	excluded
XmGetPixmap	function	full-use
XmInstallImage	function	full-use
XmIsMotifWMRunning	function	full-use
XmRemoveProtocolCallbacks	function	excluded
XmRemoveProtocols	function	excluded
XmRemoveTabGroup	function	full-use
XmRemoveWMProtocolCallbacks	function	excluded
XmRemoveWMProtocols	function	excluded
XmResolvePartOffsets	function	full-use
XmSetFontUnits	function	excluded
XmSetProtocolHooks	function	excluded
XmSetWMProtocolHooks	function	excluded
XmStringBaseline	function	excluded
XmStringByteCompare	function	excluded
XmStringCompare	function	excluded
XmStringConcat	function	excluded
XmStringCopy	function	excluded
XmStringCreate	function	excluded
XmStringCreateLtoR	function	excluded
XmStringDirectionCreate	function	excluded
XmStringDraw	function	excluded
XmStringDrawImage	function	excluded
XmStringDrawUnderline	function	excluded
XmStringEmpty	function	excluded
XmStringExtent	function	excluded
XmStringFree	function	excluded
XmStringFreeContext	function	excluded
XmStringGetLtoR	function	excluded
XmStringGetNextComponent	function	excluded
XmStringGetNextSegment	function	excluded
XmStringHeight	function	excluded

Service Name	Service Type	AES Level
XmStringInitContext	function	excluded
XmStringLength	function	excluded
XmStringLineCount	function	excluded
XmStringNConcat	function	excluded
XmStringNCopy	function	excluded
XmStringPeekNextComponent	function	excluded
XmStringSegmentCreate	function	excluded
XmStringSeparatorCreate	function	excluded
XmStringWidth	function	excluded
XmUninstallImage	function	full-use
XmUpdateDisplay	function	full-use

TABLE 3. Toolkit functions

## User Interface Language

The OSF/Motif User Interface Language (uil) functions are at present excluded from AES. Table 4 lists them.

Service Name	Service Type	AES Level
MrmCloseHierarchy	function	excluded
MrmFetchColorLiteral	function	excluded
MrmFetchIconLiteral	function	excluded
MrmFetchInterfaceModule	function	excluded
MrmFetchLiteral	function	excluded
MrmFetchSetValues	function	excluded
MrmFetchWidget	function	excluded
MrmFetchWidgetOverride	function	excluded
MrmInitialize	function	excluded
MrmOpenHierarchy	function	excluded
MrmRegisterClass	function	excluded
MrmRegisterNames	function	excluded
Uil	function	excluded
UilDumpSymbolTable	function	excluded
uil	command	excluded

TABLE 4. User interface language



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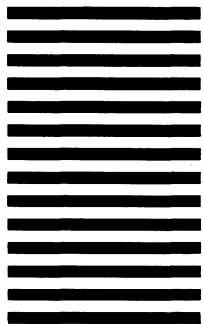
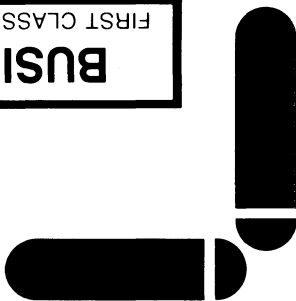


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