

PROCEDURE 1412.11  
Issued: March 22, 2001  
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SUBJECT: Terminal Emulation, Screen Scraping/Face Lifting and Presentation Integration  
Middleware Standard

APPLICATION: Executive Branch Departments and Sub-units

PURPOSE: This standard identifies the functionality of middleware products that interface with the presentation layer of legacy applications. It will describe the required characteristics and desired features of middleware in this category.

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SUMMARY:

e-Government initiatives call for integration between applications across agencies of the State of Michigan, as well as integration across businesses and all levels of government. Web to Enterprise Integration (WEI) is the systematic tying together of disparate applications. The core technology for WEI involves the use of middleware products. Middleware is a term used for any programming service that connects two or more separate and usually pre-existing programs. Middleware techniques vary depending on functional requirements and the technical environment of the applications. The common techniques recommended for the State's WEI include terminal emulation to access applications without specific client software or terminals, screen scraping to create a graphical user interface (GUI) for existing applications, and application integration to allow for multiple application integration from one or more hosts. This procedure discusses the detail for these techniques.

General Information:

**Terminal Emulation:**

Terminal emulation middleware web-enables legacy online applications by displaying terminal screen information on a standard Internet browser. An Internet emulator provides the same features of a PC based emulator such as color settings, automatic font resizing, copy and paste support, window controls, etc.

<b>Strengths</b>	<b>Weaknesses</b>
<ul style="list-style-type: none"><li>▪ Universal interface: Browser-based emulation gives users an interface they are already familiar with, reducing support and training costs.</li><li>▪ Runs on any client hardware or software architecture that supports the Java virtual machine. Nothing to install on client desktop.</li><li>▪ Easy to support: Install and configure once; deploy automatically without individual client installation.</li><li>▪ SSL (Secure Socket Layer)</li><li>▪ A thinner emulation solution: Users gain additional client resources to run other applications concurrently because there is no emulator software loaded on the desktop computer. Improves the customer's computer performance and system reliability.</li><li>▪ Lower cost: Concurrent licensing reduces per-user costs.</li><li>▪ Optional GUI Interface</li></ul>	<ul style="list-style-type: none"><li>▪ This technology is dependent on the network connection to the host. If there were a problem with the network connection to the host then you would not be able to connect</li></ul>

### Screen Scraping/Face Lifting:

Screen scraping/Face lifting is used to capture data from a legacy application screen and present it in a modernized format using standard GUI presentation components, such as radio buttons, drop down boxes, check boxes, etc.

Strengths	Weaknesses
<ul style="list-style-type: none"><li>▪ Same strengths as Terminal Emulation plus the following:</li><li>▪ Control screen appearance: Rearrange, hide and add screen elements such as buttons, drop-down list boxes, in-line scripts and more. Provide users access to only the screens and information they need:</li><li>▪ Enables auto navigation to specific host screens and make it easier for users to interface with existing host applications.</li><li>▪ Add system security: Allows restriction of screens and fields users can view and what values they can insert into fields. Permits user code and password validation as well as auto sign-on and sign-off functions.</li><li>▪ Modify appearance of screens without changing host code.</li></ul>	<ul style="list-style-type: none"><li>▪ This technology is dependent on the network connection to the host. If there were a problem with the network connection to the host then you would not be able to connect.</li><li>▪ This technology is dependent on the host application. If a change were made to the application then the screen would have to be remapped.</li></ul>

**Presentation Integration:**

Presentation Integration includes the capability to provide the following:

Combine information from multiple screens. The information contained on one or more screens from one or more applications can be integrated into one presentation session.

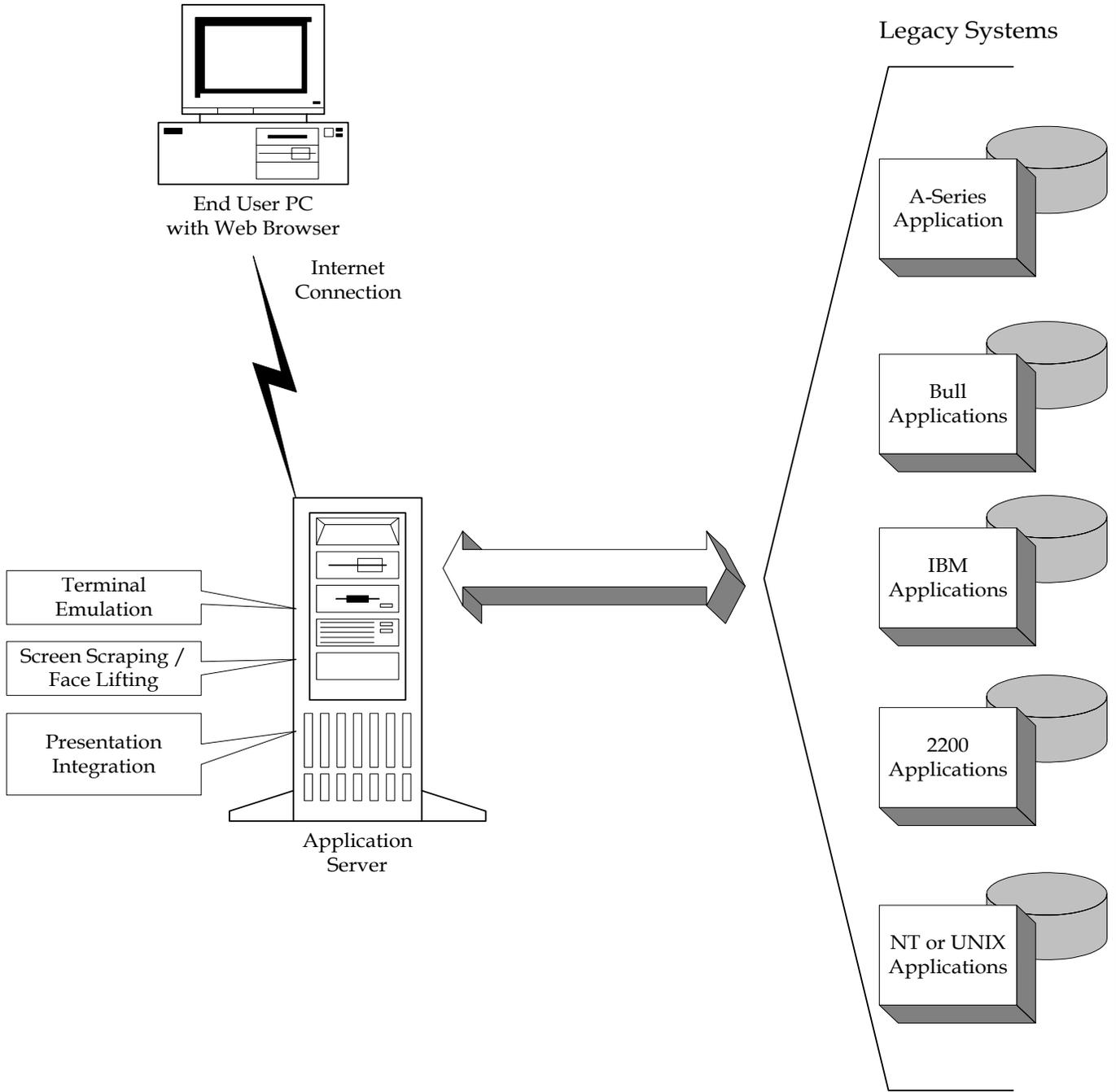
Combine information from applications on multiple hosts. The information contained on one or more applications running on multiple hosts can be integrated into one presentation session.

<b>Strengths</b>	<b>Weaknesses</b>
<ul style="list-style-type: none"><li>▪ Present real-time host data within a Web page</li><li>▪ Could be from multiple hosts and applications</li><li>▪ COM Controls for use with Active Server Pages (ASP) and other Windows applications</li><li>▪ Java Beans for use with Java applications, Servlets and Java Server Pages (JSP)</li><li>▪ Visual design tool for easy code generation and building screen templates</li></ul>	<ul style="list-style-type: none"><li>▪ This technology is dependent on the network connection to the host. If there were a problem with the network connection to the host then you would not be able to connect.</li><li>▪ This technology is dependent on the host application. If a change were made to the application then the screen would have to be remapped.</li></ul>

The chart on page 4 indicates the logical location of middleware in this category in an n-tiered processing environment.

The tables on page 5 describe both required characteristics and desirable features of middleware in this category.

# Web Enabling Applications



Middleware in the category of terminal emulation, screen scraping/face lifting and presentation integration must meet the characteristics and should meet the desired features listed in the tables below.

**Required Characteristics:**

Functional Specifications	Description
<b>Browser/Server Model</b>	Must provide access to host application access through web browser
<b>Printer Support</b>	Interface to local printer – connected to the terminal
<b>Online help</b>	Must provide comprehensive help for the end user.
<b>Clipboard Interface</b>	Full Cut, Copy and Paste including Block and Normal select modes
<b>Static Connection</b>	Dynamic and persistent host connectivity
<b>Security</b>	Compatible with the current security login procedures.
<b>Browser Independent</b>	Must be compatible with any standard web browser.
<b>Open System</b>	Open system (TCP/IP protocol support and HTTP and HTML support provided by browser) for compatibility with existing network investment.
<b>Secure Socket Layer</b>	Must support Secure Socket Layer standard capabilities.
<b>Automatic Facelift</b>	Automatically transforms Mainframe screen into an HTML formatted screen.
<b>Customizable Pages</b>	Allow you to manually configure the output of the HTML pages. (ex. Add radio buttons, drop down boxes)
<b>Multiple Platform Support</b>	Supports simultaneous sessions to the same or multiple hosts
<b>Scripting Language</b>	Must support comprehensive macros/scripting capabilities.
<b>Server Based Management</b>	Simple and centralized management for installation, setup, and maintenance.
<b>Keyboard Macros</b>	Shortcut keys for commands and provides record and playback of keystrokes.
<b>Programmable Keyboard Mapping</b>	Must provide end user with the capabilities of customizing keyboard mapping.
<b>Font selection</b>	Must provide ability to change size, style and color of fonts.
<b>GUI development tool</b>	Must provide a GUI development tool to modify the screen appearance.

**Desirable Features:**

<b>Functional Specifications</b>	<b>Description</b>
<b>XML Compatible</b>	Use of XML technology
<b>File Transfer Support</b>	Native file transfer protocol to the Mainframe.
<b>Toolbars</b>	Provides wrappable and customizable toolbars.
<b>Host Identification</b>	Identifies Connected Host on title bar while in web browser.
<b>Session Capture / Screenprint</b>	Emulator provides capability of capturing screen and saves to file or print screen.
<b>Configurable rows/columns</b>	Capability to change the number of rows/columns.

**APPLICABLE FORMS:**

**PROCEDURE:**

Maintenance:

DMB: Acquisition Services shall not approve any acquisition or purchase request without confirmation from the Department of Information Technology, Office of Strategic Policy that such request is in compliance with the standard.

Operational Unit: Any and all projects, consulting requests, equipment and software acquisition requests, or ITB's relating to Terminal Emulation, Screen Scraping/Face Lifting and Presentation Integration Middleware Standard will be subject to review for compliance with this standard.

DIT: The Office of Strategic Policy will review this standard on a continuing basis and make recommendations for changes. An appropriate group of staff, representing a wide-range of State Operational Units, will review and possibly revise these standards and guidelines as often as needed.

Exceptions from this standard for reasons other than those outlined above will be made through the exception handling process described in the Exception Process Template.

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