

## Section 7. ETA Platform Domain

The platform domain addresses requirements and technology standards for four technical topics: personal computing devices, servers, shared utility systems and desktop productivity tools.

These requirements and technology standards apply to those organizations within executive branch agencies that are responsible for supplying, managing, procuring and maintaining IT hardware, infrastructure related software, and operating systems. These organizations are hereafter referred to in the document as “Agencies with responsibilities for providing IT infrastructure”.

### *Domain-wide Requirements*

The following domain-wide requirements pertain to all topics and components in the Platform Domain:

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|-----------------|---|
| <b>PLA-R-40</b> | <b><i>Security as a Platform Decision Factor</i></b> – Agencies with responsibilities for providing IT infrastructure shall ensure that proposed hardware and software platform solutions comply with the current COV ITRM IT Information Security Standard (SEC501). |
| <b>PLA-R-02</b> | <b><i>Remote Administration of Platforms</i></b> – Agencies <u>with responsibilities for providing IT infrastructure</u> shall acquire platforms designed for ease of remote administration, diagnosis, and systems management.                                       |

### *Personal Computing Devices*

Personal computing devices include:

- Desktop and Notebook Personal Computers
- Personal Computer Operating Systems
- Displays
- PC Processors, Chipsets and Supported Interfaces
- Read/Write Devices
- Desktop-attached Printers, Copiers, Fax machines and Scanners
- Wireless Connectivity Devices
- Security Devices
- BlackBerrys, Smartphones and Push Email Services
- Surge Protection

The following are requirements for Personal Computing Devices.

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|-----------------|---|
| <b>PLA-R-03</b> | <b><i>Centralized Personal Computing Decisions</i></b> – <u>Agencies with responsibilities for providing IT infrastructure shall implement documented policies and procedures that control the acquisition, life cycle, security methods and techniques, connectivity and access methods, and ongoing maintenance support processes for personal computing devices.</u> |
|-----------------|---|

**PLA-R-38**      *Personal Computing Base Images – Agencies with responsibilities for providing IT infrastructure shall establish personal computer base images that comply with strategic office productivity and security related software technologies as defined in the COV ITRM EA Standard. These base images must also meet the minimum security requirements as defined in COV ITRM Security Standards. Customer agencies can add to these images to meet agency-specific security needs. Any changes to the base image must be recorded in a configuration management database.*

**PLA-R-39**      *Personal Computer Base Image Extensions – Agencies with responsibilities for providing IT infrastructure shall provide extensions to the base image to support business unit or departmental needs.*

**Rationale:**

*Increases uniformity while decreasing time and effort required to replace or deploy new systems.*

## **Desktop and Notebook Personal Computers**

The present recommended replacement life cycle timeframe for desktop computers is four to five years and for notebook computers three and one half to five years.

The following is a requirement for the Desktop and Notebook Personal Computers component.

**PLA-R-13**      *Replacement Life cycles for Personal Computers – Agencies with responsibilities for providing IT infrastructure shall adopt replacement life cycles of four to five years for desktop computers and three and one-half to five years for notebook computers.*

The following is a technology component standard for Desktop and Notebook Personal Computers.

<b>Table PLA-S-06: Miscellaneous PC Components Technology Component Standard</b> <i>Updated January 15, 2010</i>	
<b>Strategic:</b>	Cardbus type PC Cards with parallel interface, DMA, and 32 bit path ExpressCard <sup>8</sup> —PCMCIA Cardbus replacement that provides high speed serial access embracing USB 2.0 and PCI-Express 2.0
<b>Emerging:</b>	
<b>Transitional/Contained:</b>	PC Card with parallel interface and 16 bit path; <i>PCI; PCI-X; AGP</i> <sup>9</sup>
<b>Obsolescent/Rejected:</b>	

## Personal Computer Operating Systems

In general, the platform architecture recommends skipping releases of software when business reasons for making a change are inadequate. The agency-side costs for making a change include the costs of testing, staff learning time, staff training, business application changes, and in some cases, the costs of lost employee productivity due to software setup and learning curves slowing daily work.

The following is a technology component standard for Personal Computer Operating Systems. This standard contains a recommended move from Windows XP directly to Windows 7. As a result of that recommendation, Windows XP Pro remains strategic, Windows Vista moves to Contained due to not being chosen for implementation, and Windows 7 is placed in emerging due to its not yet being adequately tested. It is expected that Windows 7 will move to strategic following the accumulation of adequate data from real business implementations. This is expected sooner than the usual two years following release. This decision was based on the unpopularity of Vista and the good reports on the beta and release code versions of Windows 7.

The recommendation to move Windows 7 to strategic as soon as adequate testing is completed means that agencies that provide infrastructure services and their customers will need to begin testing Windows 7 immediately. All agency and business-side applications will have to be tested, new interfaces written, hardware tested or replaced, peripherals tested or replaced, etc.

Because Microsoft will stop supporting XP in 2014, XP computers put into service after June 2009 will not have a full 5 years of support from Microsoft. This means that any PC that is used beyond the support end date will be need to be re-imaged.

<sup>8</sup> This technology is now implemented throughout the market place.

<sup>9</sup> [http://www.semiapps.com/System\\_Functions/Digital\\_Interface/PCI\\_PCI\\_Express/](http://www.semiapps.com/System_Functions/Digital_Interface/PCI_PCI_Express/)

<b>Table PLA-S-01: PC Operating Systems Technology Component Standard</b> <i>Updated January 15, 2010</i>	
<b>Strategic:</b>	<p>Windows XP Pro (with tested Service Packs)</p> <p><i>Note: Windows 7 may be tested immediately in its release code or RC version and will be moved to strategic as soon as adequate evidence exists</i></p> <p>Macintosh OS X v10.x</p>
<b>Emerging:</b>	<p>Windows 7 (at the time of publication of this standard, W7 was in the earliest phases of its release cycle. Agencies who provide infrastructure services need to perform the assessment of W7 as a technology as well as their ability to deploy, manage, and support it)</p> <p>Linux (e.g. Ubuntu)</p>
<b>Transitional/Contained:</b>	<p>Windows Vista (the strategy is to skip this OS to save cost)<sup>10</sup></p> <p>Windows 2000 Professional (7-13-2010 is end-of-support)</p> <p>Macintosh OS 9.x</p>
<b>Obsolescent/Rejected:</b>	<p>Windows earlier than Windows 2000</p> <p>Any home version of Windows</p>

<sup>10</sup> Gartner: Windows 7 Release Will Affect Vista Deployment Plans; 13 May 2009; Michael A. Silver and Stephen Kleynhans. Datamation: Nearly-50-of-IT-Shops-to-Skip-Windows-Vista; December 12, 2008; Stuart J. Johnston; <http://itmanagement.earthweb.com/entdev/article.php/3790751/Nearly-50-of-IT-Shops-to-Skip-Windows-Vista.htm>. Computer World: Windows 7: Why I'm Rolling It Out Early; By Shane O'Neill; May 18, 2009 04:44 PM; <http://www.computerworld.com/action/article.do?command=viewArticleBasic&taxonomyName=Windows&articleId=9133206&taxonomyId=125&pageNumber=1>

## Displays

In the marketplace, 19 inch screens are becoming more common and have a low price. Gartner and others have suggested that the life cycle of a flat panel LCD can be 13.4 years on average<sup>11</sup> if the backlight does not fail). However, if there is an update or change to the operating system within the life cycle then the monitors in use must be checked for compatibility.

***PLA-R-06***      ***Personal Computing Desktop Displays – Display replacement decisions for all agencies including administrative units of higher education must be based on customer business needs, support considerations, cost-of-ownership data, and hardware compatibility considerations. Agencies shall ensure separate computer/display acquisition pricing.***

***Rationale:***

***Because desktop displays have a longer life cycle than the computers they support, their replacement shall not be automatic at the time of a desktop replacement.***

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<sup>11</sup> <http://www.epa.gov/oppt/dfe/pubs/comp-dic/lca/Ch2.pdf> or for the whole document and appendices, see <http://www.epa.gov/oppt/dfe/pubs/comp-dic/lca/> The EPA compares 15” LCD and 17” CRT monitor on life cycle related issues in Chapter 2. Backlights may fail between 4.0 and 13.4 years depending on the manufacturer, but they are field replaceable. These data are fairly old but more recent data are not available. In the report, discussions with Dell officials indicate that most of their LCD backlights have the 50,000 hour life or a life that exceeds the 13.4 years.

The following is a technology component standard for Displays.

<b>Table PLA-S-02: Displays and Interface Components</b> <b>Technology Component Standard</b> <i>Updated January 15, 2010</i>	
<b>Strategic:</b>	
<p><b>Display Sizes</b></p> <p>Note: Size requirements below specify only the minimum display size that is permitted for standard desktop use. High-end needs such as GIS <i>and special needs</i> are not addressed. <i>An agency may have larger display sizes.</i></p> <div style="text-align: center;">  </div> <p>Minimum of a 17" diagonal specification for a flat panel display when a flat panel is used for standard desktops. An example shape and size is presented on the left above. A typical diagonal measure is exactly 17".</p> <p>Minimum of a 20" diagonal specification for a widescreen flat panel display with a 16:10 aspect ratio. (Approximate measurements are 11" high by 16.5" wide.) An example shape is provided in the middle above.</p> <p>Minimum of a 19" diagonal specification for a widescreen flat panel display with a 3:2 or 15:10 aspect ratio. (Approximate measurements are 10" high by 16" wide.) An example shape is provided on the right above.</p> <p><b>Display life cycle</b></p> <p><i>A desktop flat panel solution is to be used for its full life which may include backlight replacement.</i></p> <p><b>Flat Panels</b></p> <p>A flat panel is the standard recommended replacement for desktop displays.</p> <p><b>Mouse</b></p> <p>An optical USB mouse is the standard recommended replacement to be included with a desktop.</p> <p><b>Keyboard</b></p> <p><i>A USB keyboard is the standard recommended replacement to be included with a desktop.</i></p>	
<b>Emerging:</b>	<p>OLED or Active Matrix OLED (AMOLED) displays (e.g., AMOLED in iRiver Clix Gen2) <i>Light emitting diode displays are in higher use for small MP3/4 sized screens to large outdoor displays but still have not made a large impact in the personal computing space.</i></p>
<b>Transitional/Contained:</b>	<p>Less than 17" flat panel for desktops <i>CRT (e.g., smaller displays may be appropriate for point of sale)</i></p> <p>Mechanical Mouse</p>
<b>Obsolescent/Rejected:</b>	<p><i>CRT for desktop replacements</i></p>

## PC Processors, Chipsets and Supported Interfaces

Typically, the components of a computer are determined by the manufacturer with little choice on the part of the purchaser unless units are custom built. For personal computers, the Intel processors and chipsets dominate the market, but AMD and others offer equivalent business utility, often at a lower price. At present, with Office 2003 and Windows XP, most available processors and chipsets include features that exceed the needs of the typical office worker given the software they use and the way they work. A dual core processor may be helpful to users who have numerous applications running at the same time.

**PLA-R-07**      **Personal Computing Processors and Chipsets – Agencies with responsibilities for providing IT infrastructure involved in acquisitions and contracts shall establish minimum bid specifications for low-end personal computers to be used by the majority of the workforce. These specifications shall include the lowest of the currently available Intel, AMD, or comparable chipsets and components that will cost-effectively meet the anticipated processing needs for productivity software, typical business needs, special needs of the mobile worker, and/or needs related to life cycle requirements. Example: the future availability of various memory options (DDR SDRAM, DDR2, DDR3, etc.) if users’ memory needs increase during the life cycle of their desktops or notebooks.**

## Read/Write Devices

The devices addressed here are desktop and notebook devices that read from and write to transportable external media. “Writable” media for desktops and notebooks include floppies, CDs, DVDs, USB drives (which go by many names) and more.

**PLA-R-08**      **Personal Computing Optical Drives – Agencies with responsibilities for providing IT infrastructure involved in procurements and contracts shall include a CD/DVD reader with CD or DVD write capabilities when establishing minimum bid specifications for desktop and notebook personal computers.**

The following is a technology component standard for Read/Write Devices.

<b>Table PLA-S-03: Read/Write Devices (Storage) Technology Component Standard</b> <i>Updated January 15, 2010</i>	
<b>Strategic:</b>	
	<p>USB Flash Drives</p> <p><i>USB drives typically store from 1 to 64 GB and may include security software options. With security software, they are the preferred choice for transporting sensitive files and information. These drives are recommended over CDs and DVDs for employee storage use.</i></p> <p>A CD/DVD Combo Drives</p> <p><i>CDs and DVDs remain popular for loading software and viewing multimedia, but are waning in popularity for storage. They have moved to external devices in the smallest form factor computers because they are not generally used but still may be required for loading software in certain cases.</i></p> <p>External USB Hard Drives and DVD/CD drives</p> <p><i>External drives are another option for mobile worker backups when connectivity is not available</i></p> <p>Blu-Ray Drives (BD-R)</p> <p><i>PC manufacturers now have blu-ray players in notebooks and desktops at prices around \$150. However, they are not likely to be provided in the near future on a standard computer for the Commonwealth.</i></p>
<b>Emerging:</b>	<p><i>Blu-ray BD-RW (write technologies continue to be too costly for general use. When prices decrease, this technology may become common in personal computing)</i></p> <p>(For enterprise storage use of Blu-Ray disks and DVDs, see the shared utility services technical topic)</p>
<b>Transitional/Contained:</b>	<p>Shared external <i>floppy drives</i> may be of transitional use to agencies.</p>
<b>Obsolescent/Rejected:</b>	<p>Zip Drive (lomega)</p> <p>Jaz Drive (lomega successor to Zip Drive)</p> <p>5 ¼ Floppy</p> <p>3.5 Floppy Drive in a PC</p>

## Desktop-attached Printers, Copiers, Fax machines and Scanners

Some agencies tend to use large numbers of desktop-attached printers. In some cases, this usage pattern is because of continuous printing of confidential information or printing forms that require an ink signature from the customer who is in the worker's office. Others are used because a worker's job requires label printing or special document printing (e.g., certificates). As many as half of the printers presently in use across agencies are desktop attached.

The following is a technology component standard for Desktop-attached Printers, Copiers, Fax machines and Scanners.

<b>Table PLA-S-04: Desktop Attached Printing Technology Component Standard</b> <i>Reviewed January 15, 2010</i>	
<b>Strategic:</b>	Laser printing devices are required for non-mobile black and white printing uses in situations where a desktop attached black and white printer must be used  (Note: Desktop attached printers are strongly discouraged for most workers. See discussion in Utilities section.)
<b>Emerging:</b>	
<b>Transitional/Contained:</b>	Desktop attached (non-mobile) ink-jet printers for black and white printing are to be phased out  (Note: Desktop attached printers are strongly discouraged for most workers. See discussion in Utilities section.)
<b>Obsolescent/Rejected:</b>	

## Wireless Connectivity Devices

Although use of wireless technologies for mouse and keyboard connections is becoming more popular, the more typical wireless connections in Commonwealth offices are for notebook connections to the local area network in conference rooms, PDA/smartphone connections to desktops, and Blackberry connections to servers. Wireless printing is rare.

The following is a technology component standard for Wireless Connectivity Devices.

<b>Table PLA-S-05: Miscellaneous Mobile Components Technology Component Standard</b> <i>Updated January 15, 2010</i>	
<b>Strategic:</b>	<p>Receivers/transmitters for Local and Personal area networks (LAN &amp; PAN) and mobile devices</p> <p>IrDA—infrared used on handhelds</p> <p>Bluetooth devices <u>2.1+EDR</u>; <u>3.0</u></p> <p>WiFi 802.11 (a+b+g)</p>
<b>Emerging:</b>	<p><i>WiMax Capable Devices</i></p> <p><i>True Mobile 4G services from Sprint are supported by a few devices including Centrino 2, an IBM Thinkpad, and some Aircards. Devices supporting new mobile wireless WiMax standards and those in development will make this a reality in more locations if the economy permits progress. This means very high speed connectivity and data transfers in moving vehicles. Mobile 4G services are in place in the US in Baltimore (Sprint XOHM) with the next nearest (to Virginia) service to be in DC. There are no plans for services in VA at present, thus leaving this technology in the Emerging category for some time.<sup>12</sup> XOHM users have had some connectivity problems. IEEE ratification was expected in March 2009, but another RFC was created.</i></p> <p><i>802.11n WiFi Capable Devices</i></p> <p><i>Provides next generation wireless with reduced distance degradation and better multimedia streaming at higher speeds; ratification of the standard expected in the Fall of 2009 (100 Mbs). Use of devices on the market requires infrastructure replacements that are not permitted until ratified. However, devices may have n capabilities built in (e.g., notebook chipsets) as long as it is not used.</i></p>
<b>Transitional/Contained:</b>	<p>PC Cards (PCMCIA) and internal devices (e.g., embedded in chipsets) that are not receiving all ratified standards including 802.11 a, b and g (to maximize wireless network design possibilities) and soon, 802.11n</p> <p>Bluetooth devices, less than <u>version 2.1</u></p>
<b>Obsolescent/Rejected:</b>	

<sup>12</sup> Sprint's 4G Xohm WiMax: How fast is it?; By Brian Nadel; October 10, 2008 12:00 PM ET: Computer World.  
<http://www.computerworld.com/action/article.do?command=viewArticleBasic&taxonomyName=Mobile+and+Wireless&articleId=9116844&taxonomyId=15&pageNumber=2>

## Surge Protection

All computers that are used to store valuable information should have some form of power surge protection when they are plugged in to electrical, cable, network or phone wiring.

**PLA-R-15**     **Surge Protection for Field Workers** – Agencies shall provide a surge protector that can protect from surges through electrical inputs including network, telephone and power lines to field workers who need to protect the data stored on their personal computers.

**Rationale:**

The term, “field worker” includes teleworkers, roadway inspectors, park rangers and similar workers who work outside of a networked office. Workers in networked environments typically have the needed data protection, data backups, and server UPS protections provided through their computing environments. Teleworkers typically store data continuously through Virtual Private Networks (VPNs) that connect to protected telecommunications and servers.

## Servers

The platform domain addresses servers as single hardware devices and as configurations for utility service provision. Servers as hardware include the full range of computing devices from mainframe computers to small single-socket computers. The following server components are addressed:

- High-end servers including OS
- Midrange/low-end servers including OS
- Consolidation platforms

The following are requirements for Servers.

**PLA-R-17**     **Maintenance Agreements** – Agencies with responsibilities for providing IT infrastructure and/or service providers shall ensure that servers which support production are under a maintenance agreement for the planned life of the server. For x86 architecture, the planned life shall be a minimum of five years.

**PLA-R-18**     **File Servers** – Agencies with responsibilities for providing IT infrastructure shall migrate to either NAS (Network Attached Storage) or SAN (Storage Area Network) or combination whenever feasible and cost beneficial.

**PLA-R-19**     **OEM (Original Equipment Manufacturer) Operating Systems** – Agencies with responsibilities for providing IT infrastructure shall not use OEM provided operating systems (OS) for x86 server hardware.

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**PLA-R-36**      ***Server Capacity** – Agencies with responsibilities for providing IT infrastructure shall consider growth requirements over the server life to enable minimizing costs and reducing wasted capacity.*

**Rationale:**

*Planning may enable acquisition of a small number of large capacity memory modules instead of a large number of smaller modules and may enable avoiding excess and underused server capacity.*

**PLA-R-37**      ***Supported Server Operating Systems** – The release version levels of all server operating systems shall have vendor or equivalent level support. This support shall include security update and hotfix support. The use of unsupported open source server operating systems shall be avoided.*

### **High-End Servers**

High-end servers are defined as servers that may scale to more than 16 sockets in size and that use highly specialized architectures and processors. These mainframe-type servers typically cost more than \$250,000 and have significantly greater capabilities in areas including reliability, availability, serviceability, security, privacy, business continuity provision, management consistency, and risk reduction. The operating systems such as zOS provide these characteristics. They are more scalable than midrange servers, which have similar characteristics (e.g., SMP/NUMA).

The following is a technology component standard for High-End Servers.

<b>Table PLA-S-08: High-End Servers Technology Component Standard</b> <i>Updated January 15, 2010</i>	
<b>Strategic:</b>	<p>Software</p> <ul style="list-style-type: none"> <li>z/OS</li> <li>Solaris*</li> <li>HP-UX</li> <li>AIX</li> <li>Windows (<i>may not be keeping up with hardware advances</i>)</li> <li>Linux in virtual partitions</li> <li>Virtual Server OSs (e.g., zVM, VMware, strategic only for: supporting OSs that are in the desired future architecture (e.g., Linux, Windows, HP-UX and Solaris* <i>and for</i> use in building test environments</li> <li><i>Hypervisors are critical management tools for provider and agency-side cost reduction</i></li> </ul> <p>Hardware</p> <ul style="list-style-type: none"> <li>IBM, Sun*, and HP platforms are strategic.</li> <li>Hardware alternatives to these platforms may be considered if they are fully compatible for running applications designed for strategic systems, provide equal or better performance for all application and architectural requirements, and introduce no problems to the Virginia architecture other than those that may be cost-effectively resolved. (Fujitsu, for example, is an alternative to Sun* for the Solaris OS)</li> </ul> <p>* Note: <i>Sun's Q3 2009 acquisition of Oracle may cause Sun's and Solaris' inclusion in "Strategic" to be reevaluated</i></p>
<b>Emerging:</b>	<p>Software</p> <ul style="list-style-type: none"> <li>Windows Virtual Server 2008 R2</li> <li>Hyper V</li> </ul>
<b>Transitional/Contained:</b>	<p>Software</p> <ul style="list-style-type: none"> <li>Unisys OS2200</li> <li>VMS</li> <li>Unix other than Solaris, AIX, Linux, and HP-UX</li> <li>Virtual Server OSs used to support older versions of a strategic OS in cost-effective consolidation transitional plans</li> <li>OS 5i (<i>formerly OS/400</i>)</li> </ul> <p>Hardware</p> <ul style="list-style-type: none"> <li>IBM ES9000 (9221)</li> </ul>
<b>Obsolescent/Rejected:</b>	<p>Software</p> <ul style="list-style-type: none"> <li>MVS XA</li> <li>MPE</li> <li>OS/400 (<i>library OS</i>)</li> <li>MVS OS/390</li> </ul>

## Midrange to low-end Servers

Midrange to low-end servers typically cost \$50,000 or less. The low-end servers would usually have one to four sockets, but with dual-core or quad core processors that are multithreaded, they are quite powerful. With the wide variety of configurations possible, these servers will be able to scale both up based on processors chosen and scale-out via cluster and mesh configurations. Typically, these servers run Linux and Windows.

The following is a technology component standard for Midrange/Low-end Servers.

<b>Table PLA-S-09: Midrange/Low-end Servers Technology Component Standard</b> <i>Updated January 15, 2010</i>	
<b>Strategic:</b>	<p><b>Software</b> Windows Server 2003 family <i>Microsoft Windows Server 2008 not including Hyper-V</i> Unix (Solaris, AIX, HP-UX and Linux) Virtual Server OSs (e.g., VMware and zVM; <u>Xen Virtual Hypervisor</u>)</p> <p><b>Examples</b> Windows Server 2003/2008 and Exchange 2007 servers are especially appropriate for shared utility services including domain controller, file, print, email, etc. Linux may be an alternative for Web, database, and shared utility services Virtual servers and virtual machines aid in providing test environment setup</p> <p><b>Hardware</b> Numerous manufacturers compete for low to midrange server hardware; narrowing the variety used by the Commonwealth at a point in time is important to reducing acquisition, maintenance and support across agency solutions <i>Multicore processors will be used increasingly as a method of improving processing capabilities of server hardware, but without corresponding application changes to take advantage of multithreading and parallel processing, agencies may see application degradation rather than improvement when moved to new hardware.</i></p>
<b>Emerging:</b>	<p><b>Software</b> <i>Microsoft Windows Server 2008 with Hyper-V (still scalability issues; may meet certain needs well)</i> Microsoft Windows Server 2008 R2</p>
<b>Transitional/Contained:</b>	<p><b>Software</b> Windows 2000 <i>Advanced Server</i> family (By June 2010, agencies should have completed migration of all business applications to a newer version. Migrations should be underway well before the support end date; extended support is presently scheduled for ending July 13, 2010) Virtual Server OSs (e.g., VMware hypervisor, Integrity Virtual Machines, and in some cases, Windows 2003 Virtual Server R2) enable transition strategies for multiple versions of the same OS OS10 Server as a transitional OS for aiding in the use of Windows staff for Unix work due to the Windows-like user interface instead of command line</p>
<b>Obsolescent/Rejected:</b>	<p><b>Software</b> NT Novell OSX</p>

## Consolidation Platforms

A consolidation platform is typically a single high-end platform or a large aggregation of midrange or low-end platforms.

The following are technology component standards for Consolidation Platforms.

<b>Table PLA-S-10:</b> <b>Consolidate by aggregation on midrange to high-end platforms</b> <b>Technology Component Standard</b> <i>Updated January 15, 2010</i>	
<b>Strategic:</b>	<p>Software</p> <ul style="list-style-type: none"> <li>Unix (HP-UX, Solaris, AIX and Linux)-- <i>(caution: Q3 2009 acquisition of Sun by Oracle)</i></li> <li>z/OS</li> <li>Windows</li> </ul> <p>Consolidation Examples:</p> <p style="padding-left: 20px;">Appropriate for critical application and database tiers that require exceptional scaling, speed, transaction processing, reliability, etc.)</p> <p>Hardware</p> <p style="padding-left: 20px;">Exceptional partitioning and workload management are required for the server solution. Example platforms include but are not limited to: IBM Mainframe, IBM POWERx, Sun/Fujitsu* SPARC/UltraSPARC, Fujitsu/HP Itanium x (64) and AMD Opteron (64). <i>(caution: Q3 2009 acquisition of Sun by Oracle)</i></p> <p>* <i>Note: Sun's Q3 2009 acquisition of Oracle may cause Su/Fujitsu's' inclusion in "Strategic" to be reevaluated</i></p>
<b>Emerging:</b>	<p><i>Ongoing management improvements. Ongoing CPU improvements: Multicore expansion to 8, 12+ processors; power saving design changes; thread count increases; cache increases.</i></p>
<b>Transitional/Contained:</b>	
<b>Obsolescent/Rejected:</b>	<p>Software</p> <ul style="list-style-type: none"> <li>MPE</li> <li>MVS OS 390</li> <li>Unisys OS2200</li> <li>VMS</li> <li>OS/400</li> <li>IBM ES9000 (9221)</li> </ul>

**Table PLA-S-11: Consolidate by Scaling Out  
Technology Component Standard**

*Updated January 15, 2010*

<b>Strategic:</b>
<p>Software</p> <ul style="list-style-type: none"> <li>Windows Server 2003/<u>2008</u></li> <li>Solaris*</li> <li>HP-UX</li> <li>AIX</li> <li>Linux</li> </ul> <p>Examples</p> <p>(Note: clustering capabilities may come from other software such as MySQL Cluster which runs on most of the above operating systems.)</p> <p>Clusters are appropriate for MS Exchange Server (e.g., an email farm): clustered low-end to low midrange solution on Windows Server 2003/<u>2008</u>.</p> <p>Appropriate as a tier for single large or mirrored databases—e.g., Oracle real application clusters (RAC) running on HP-UX, AIX, Windows or Linux.</p> <p>Appropriate for Web hosting: (e.g., on Windows Server 2003/<u>2008</u>, HP-UX, Solaris*, AIX or Linux)</p> <p>Hardware</p> <p>Typical solutions include farms/clusters using blades or servers in racks. Commodity servers are commonly employed. Other options are possible.</p> <p>* <i>Note: Sun's Q3 2009 acquisition of Oracle may cause Solaris' inclusion in "Strategic" to be reevaluated</i></p>
<b>Emerging:</b>
<b>Transitional/Contained:</b>
<b>Obsolescent/Rejected:</b>
<p>Software</p> <ul style="list-style-type: none"> <li>Windows NT</li> <li>Windows 2000</li> </ul>

**Table PLA-S-12: Consolidate using virtual tools**  
**Technology Component Standard**

*Updated January 15, 2010*

**Strategic:**

Software

Virtual Servers (via Hypervisors, or Virtual Machine Software)  
zVM or VMware

Permit virtual Windows, Solaris\*, AIX, HP-UX, or Linux machines or servers in scale-out solutions provided via zVM or VMware

Hardware

Typical solutions include low-end to high-end servers whose resources are divided and shared among the virtual servers which run natively within the multiple partitions.

\* *Note: Sun's Q3 2009 acquisition of Oracle may cause Solaris' inclusion in "Strategic" to be reevaluated*

**Emerging:**

Software

*Windows 2008 Hyper V (Virtual Server) (scaling issues)*

Hardware

Intel and others are working to improve sub-processor partitioning capabilities

**Transitional/Contained:**

Software

*Windows Virtual Server (still lacks scalability needed for many scale-out applications)*

Permit virtual servers of older versions of supported OS in transitional efforts (may have some use here)

**Obsolescent/Rejected:**

## ***Shared Utility Services***

Shared utility services promote centralization and common handling of networked services that are currently implemented in many different ways using different practices across the served agencies and customers.

***PLA-R-20***      ***Standardized Utilities*** – *Agencies with responsibilities for providing IT infrastructure shall standardize deployment, management methods and procedures for shared utility services where possible.*

***PLA-R-21***      ***Microsoft Utilities*** – *Agencies with responsibilities for providing IT infrastructure shall consider Microsoft best practices as guides for standardizing Microsoft Windows services across agencies until alternative shared utility services are studied and alternative methods are put into place.*

### **Implications:**

*This requirement should not be construed to mean that only Microsoft Windows solutions shall be deployed for utilities, or that only Microsoft best practices should be used. Any alternatives considered should be analyzed using Microsoft utilities and Microsoft deployment recommendations as the base service to which alternatives may be compared.*

*For example, the majority of web server deployments may use IIS servers and may follow Microsoft best practices for their deployment. The alternative shared utility services below may have general benefit for agencies, but should be compared in cost and benefit analyses with other in-architecture options before proceeding. Example alternative shared utility services include:*

- *Linux as a database OS (e.g., ESRI; Oracle RAC on Linux, MySQL clusters)*
- *Linux for selected utilities including web hosting running on low-end servers or in soft partitions on midrange or high-end servers*
- *Linux for selected business applications proven on this platform*
- *Apache servers on Linux instead of IIS servers on Windows*

## **Storage Utilities**

The term “storage system” encompasses the hardware, software, communications, networking, media, media controllers and management tools required to record data somewhere other than on a local PC and to index the data in a manner that allows it to be retrieved at a later time.

- PLA-R-22**      **Storage and Capacity Planning Data** – Agencies shall perform periodic capacity and storage planning and provide those plans when requested to the agency with responsibilities for providing their IT infrastructure. The availability of planning data will improve storage, backup and disaster recovery solutions for the Commonwealth.
- PLA-R-23**      **Agency Assistance for Capacity and Storage Planning** – Agencies with responsibilities for providing IT infrastructure must offer capacity planning and storage planning services to assist supported agencies in determining their present and future requirements.
- PLA-R-24**      **Storage and Capacity Planning Scope** – Agencies shall consider all of their applications when conducting capacity planning and when developing a storage plan.
- PLA-R-25**      **Consolidated Server Storage Planning** – Agencies with responsibilities for providing IT infrastructure that manage storage consolidation shall design consolidated storage solutions with for servers used by multiple applications within an agency, by multiple agencies, or managed as a group across agencies and applications.
- PLA-R-29**      **Backup Consolidation and Simplification** – Agencies with responsibilities for providing IT infrastructure shall consider the value of improved backup and recovery management, reduced backup and recovery costs, and improved backup and recovery service levels when developing storage management plans and costs. This very important benefit of server and storage consolidation must be included in cost comparisons.
- PLA-R-31**      **Connectivity and Consolidated Storage** – Agencies with responsibilities for providing IT infrastructure shall include assessments of connectivity needs and options for the customer base when designing consolidated storage solutions.
- Rationale:*  
A consolidated solution often requires added connectivity. This connectivity may both increase costs and degrade throughput. The distance to the consolidation system and the costs of connectivity may be critical factors. Solutions including iSCSI, MPLS VPNs, WAFS, blade chassis, storage virtualization, and SAS are among the tools that may be beneficial in reducing total storage costs.
- PLA-R-32**      **Storage Location Considerations** – Agencies with responsibilities for providing IT infrastructure when designing consolidated storage solutions must evaluate the cost-effectiveness of locally consolidated storage options for the physically co-located servers if central remote storage is cost-prohibitive.

The following is a technology component standard for Storage Systems.

<b>Table PLA-S-13: Storage Interfaces Technology Component Standard</b> <i>Updated January 15, 2010</i>	
<b>Strategic<sup>13</sup>:</b>	<p><i>FC—FIBRE Channel single or multimode up to 12.75 Gbps in each direction: Topologies—FC-AL (arbitrated loop), FC P2P (point to point), FC SW (switched); typically Remote FCIP)</i></p> <p>FICON SCSI 10/100/Gb Ethernet; 10/100/2Gb Ethernet iSCSI PCI Express FC-IP 10GigE SAS (Serial Attached SCSI) InfiniBand (IB)</p>
<b>Emerging:</b>	<p><i>FCoE (Fibre Channel over Ethernet)</i></p> <p><i>10 GB Ethernet</i></p>
<b>Transitional/Contained:</b>	<p>10/100 Ethernet</p>
<b>Obsolescent/Rejected:</b>	<p>ESCON, 17 Mbps (Mainframe) Block/Parallel (distance limits and speed problems) 4.5 Mbps (Mainframe)</p>

<sup>13</sup> For example, these are 2008 high end storage connectivity solutions: The Symmetrix 8000 series provides concurrent multi-host support for a wide range of open systems and mainframe platforms and operating systems with Ultra/Ultra2 SCSI, ESCON, FICON, and Fibre Channel (FC-AL or FC-SW) interfaces. Connect storage from virtually all UNIX, Windows2000/NT, Linux, mainframe, PC LAN, and AS/400 servers.  
[http://www.sandirect.com/product\\_info.php?cPath=145\\_152&products\\_id=352](http://www.sandirect.com/product_info.php?cPath=145_152&products_id=352)

## Print, Fax, Scan and Copy Devices

For networked print, fax, scan and copy services, the standardizing of hardware, software, supplies, deployment, management, and staff training all offer high potential savings when coupled with paper reduction efforts.

***PLA-R-33***      ***Print, Fax, Scan and Copy Devices and Managing Servers – Agencies with responsibilities for providing IT infrastructure shall manage and refresh as needed in a consistent, scheduled manner all customer-oriented input and output devices that are deployed as networked devices. These devices include document scanners, fax machines, copiers, and printers along with the servers that support them.***

## Email Utilities, Related Communications Utilities, and Coordination Services

Historically, communications services such as email, BlackBerrys, calendaring, scheduling, conferencing, and other communications, coordination, and personal organization services were provided by individual agencies. Sometimes, the agencies used more than one product to address the email, calendaring and related needs. Typically, with the exception of phone contracts, the decisions were not made from an enterprise-wide perspective.

***PLA-R-41***      ***Central Email Storage and Related Electronic Document Storage Solutions – Storage for email shall address business needs and Commonwealth and Federal document retention requirements. Examples: Virginia Public Records Act and Federal HIPAA requirements.***

The following is a technology component standard for email.

<b>Table PLA-S-16: Email Technology Component Standard</b> <i>Updated January 15, 2010</i>	
<b>Strategic:</b>	Microsoft 32 bit Exchange Server 2003 <i>Microsoft Exchange Server 2007 (weak value of upgrade without implementing Microsoft unified messaging)</i> <i>Email SAAS (e.g., Google, Microsoft, Yahoo, or similar email for college students)</i>
<b>Emerging:</b>	<i>Microsoft Exchange Server 2010 (weak value anticipated without switching to Microsoft unified communications)</i> <i>3<sup>rd</sup> Party solutions for email storage management policy implementation (Microsoft is still lacking in this area; this is a crucial part of email service provision)</i>
<b>Transitional/Contained:</b>	Microsoft Exchange Server 2000 (Extended support ends in 2011) Unsupported open source implementations <i>Non-Exchange for VITA served-agencies</i>
<b>Obsolescent/Rejected:</b>	Microsoft Exchange Server 5.5 and earlier

### ***Desktop Productivity Tools***

The desktop productivity tools topic addresses the following technical components:

- Office Suite
  - Word Processing
  - Spreadsheet
  - Presentation
  - E-mail Client & Calendaring
  - Personal Database
- Web Browser
- PDF Authoring and Reading
- Desktop Publishing
- Desktop Project Management
- Diagramming
- File compression

The following are requirements for desktop productivity tools.

***PLA-R-11***      ***Minimum Productivity Software for Meeting Knowledge Worker Needs –***  
*The Commonwealth’s personal computing software architecture for new desktops and notebooks shall include: Microsoft Office, Internet Explorer, Visio Reader, and Adobe Reader. (Note: Access is not to be included in the minimum base image for most knowledge workers.)*

***PLA-R-43***      ***Desktop Productivity Tools Version/Release Levels.*** *The version/release levels of all desktop productivity tools included in the base images deployed by agencies that provide infrastructure services shall have vendor or equivalent level support. This support shall include security update and hotfix support.*

## Office Suite

An office suite is a collection of programs intended to be used by typical knowledge workers. These programs are distributed together, have a consistent user interface and can interact with each other. Office suites can include the following types of software to meet knowledge worker needs:

- Word Processing
- Spreadsheet
- Presentation
- E-mail Client & Calendaring
- Personal Database

The following is a requirement for the Office Suite component.

***PLA-R-42***      ***Personal Database Products*** – *Personal or desktop database products such as Microsoft Access, Lotus Approach, or Paradox, are considered desktop productivity tools which shall not be used as a database for multi-user applications. They may be used as a front-end for strategic technology relational databases.*

### ***Implications:***

*Agencies that currently have multi-user applications using personal database products as a database should plan for modifying, replacing, or eliminating the application to avoid substantial risk. A migration or replacement plan must be included as part of the Agency’s IT Strategic Plan.*

The following is a technology component standard for Office Suites.

<b>Table PLA-S-17: Office Suite Technology Component Standard</b> <i>New: January 15, 2010</i>	
<b>Strategic:</b>	<p>Microsoft Office 2003 with appropriate service packs and including the Office Compatibility Pack from Microsoft</p> <p>Microsoft Office 2007 with appropriate service packs</p> <p>Word, Excel and PowerPoint Viewers (highest version evaluated and tested for the environment and earlier versions that still have Microsoft Office mainstream support)</p> <p><b>E-mail for Colleges and Universities</b></p> <p>Google mail, Microsoft Mail, and Yahoo Mail are strategic for those Colleges and Universities that wish to provide email for students. Considerable caution should be exercised for non-student use.</p> <p><b>Note:</b> Microsoft Office includes: Word, Excel, PowerPoint and Outlook. The Professional suite version also includes Access.</p>
<b>Emerging:</b>	<p>Microsoft Office 2010 began beta testing in November, 2009 and is scheduled for general release in June 2010</p>
<b>Transitional/Contained:</b>	<p>Microsoft Office Professional XP (extended support ends July 12, 2011). EA Exception required only for installation on a new PC.</p> <p>Word, Excel and PowerPoint Viewer versions that Microsoft Office is in its extended (security hotfixes still available) support life cycle</p>
<b>Obsolescent/Rejected:</b>	<p>All Microsoft Office versions that no longer have Microsoft extended support (beyond support life cycle)</p> <p>Word, Excel and PowerPoint Viewer versions that no longer have Microsoft Office extended support (beyond support life cycle)</p>

## Web Browser

A web browser is an application for retrieving, presenting, and traversing information resources on the World Wide Web. Information resources may be a web page, image, video, or other piece of content and are identified by a Uniform Resource Identifier (URI). Although browsers are primarily intended to access the Internet, they can also be used to access information provided by private networks or files.

The following is a technology component standard for Web Browsers.

<b>Table PLA-S-18: Web Browsers Technology Component Standard</b> <i>New: January 15, 2010</i>	
<b>Strategic:</b>	Microsoft Internet Explorer (highest version evaluated and tested for the environment and earlier versions that still have full vendor or equivalent support) Mozilla Firefox 3.0.11 or a later well-tested, non-beta version
<b>Emerging:</b>	Mozilla Firefox 3.5 (at time of writing) Open Source Browsers (e.g., Safari, Chrome, Opera 9.6, Opera Mini 4.2, and other Opera products)
<b>Transitional/Contained:</b>	All versions of Internet Explorer and Firefox that are in their extended (security hotfixes still available) support life cycle
<b>Obsolescent/Rejected:</b>	All versions of Internet Explorer and Firefox that are beyond their support life cycle (no longer have vendor or equivalent support)

## PDF Authoring and Reading

Portable Document Format (PDF) is a file format created by Adobe Systems for document exchange. PDF is used for representing documents independently of application software, hardware, or operating system. PDF was officially released as an open standard in 2008. Commonwealth knowledge workers can use Adobe Reader to view, search, digitally sign, verify, print, and collaborate on PDF documents. Knowledge workers can use Adobe Acrobat or other approved freeware PDF Authoring solutions to create PDF documents including data collection forms.

The following is a technology component standard for PDF Authoring and Reading.

<b>Table PLA-S-19: PDF Authoring and Reading Technology Component Standard</b> <i>New: January 15, 2010</i>	
<b>Strategic:</b>	<p>Adobe Reader, Adobe Acrobat and plug-ins (highest version evaluated and tested for the environment and earlier versions that still have full vendor or equivalent support)</p> <p>Approved freeware PDF Authoring solutions: PrimoPDF, CutePDF, Bullzip PDF Printer, PDFCreator, PDF 995 (highest version evaluated and tested for the environment and earlier versions that still have full vendor or equivalent support)</p>
<b>Emerging:</b>	
<b>Transitional/Contained:</b>	<p>All versions of Adobe Reader, Adobe Acrobat and plug-ins, and other PDF Authoring and Reading products that are in their extended (security hotfixes still available) support life cycle</p> <p>Non-approved PDF Authoring freeware solutions that still have full vendor or equivalent support</p>
<b>Obsolescent/Rejected:</b>	<p>All versions of Adobe Reader, Adobe Acrobat and plug-ins, and other PDF Authoring and Reading products that are beyond their support life cycle (no longer have vendor or equivalent support)</p>

## Desktop Publishing

Desktop publishing allows knowledge workers to create “what you see is what you get” (WYSIWYG) publication quality documents for both large scale publishing and for small scale local multifunction output and distribution. Historically, Commonwealth knowledge workers have used multiple desktop publishing solutions.

The following is a technology component standard for Desktop Publishing.

<b>Table PLA-S-20: Desktop Publishing Technology Component Standard</b> <i>New: January 15, 2010</i>	
<b>Strategic:</b>	<p>Microsoft Office Publisher (and Viewer) versions: 2003 and 2007 (included In Microsoft Office)</p> <p>Adobe InDesign, Adobe Acrobat and plug-ins, and QuarkXPress from Quark, Inc. (highest version evaluated and tested for the environment and earlier versions that still have full vendor or equivalent support)</p>
<b>Emerging:</b>	
<b>Transitional/Contained:</b>	<p>All Microsoft Publisher/Office versions that are in their extended (security hotfixes still available) support life cycle</p> <p>All versions of Adobe InDesign, Adobe Acrobat and plug-ins, and QuarkXPress that are in their extended (security hotfixes still available) support life cycle</p> <p>Adobe PageMaker</p>
<b>Obsolescent/Rejected:</b>	<p>All Microsoft Publisher/Office versions that no longer have Microsoft extended support (beyond support life cycle)</p> <p>All versions of Adobe InDesign, Adobe PageMaker, Adobe Acrobat and plug-ins, and QuarkXPress that are beyond their support life cycle (no longer have vendor or equivalent support)</p>

## Desktop Project Management

Project management software assists project managers in developing plans, assigning resources to tasks, tracking progress, managing budgets, analyzing workloads and documentation of projects.

Microsoft Office Project (Standard and Professional) is used by many project managers in the Commonwealth as a desktop project management productivity tool.

Microsoft Office Project Server is a server based tool that stores project information in a central database that supports project management across an organization. Managers can drill down into project details and can communicate project plans and distribute task assignments to team members. The team member can communicate status and changes to project manager by using Microsoft Office Project Web Access. Project Web Access is the thin web client (installed on the desktop) for Microsoft Office Project Server that can view, analyze, and report on information as well as create project proposals and activity plans.

The following is a technology component standard for Desktop Project Management.

<b>Table PLA-S-21: Desktop Project Management Technology Component Standard</b> <i>New: January 15, 2010</i>	
<b>Strategic:</b>	<p>Microsoft Office Project Standard and Professional (highest version evaluated and tested for the environment and earlier versions that still have Microsoft mainstream support)</p> <p>Microsoft Office Project Web Access (highest version evaluated and tested for the environment and earlier versions that still have Microsoft mainstream support)</p>
<b>Emerging:</b>	
<b>Transitional/Contained:</b>	All Microsoft Project and Project Web Access versions that are in their extended (security hotfixes still available) support life cycle
<b>Obsolescent/Rejected:</b>	All Microsoft Project and Project Web Access versions that no longer have Microsoft extended support (beyond support life cycle)

## Diagramming

Knowledge workers can represent visual information in the form of diagrams such as flowcharts by using a diagramming program. Such programs are usually Graphical User Interface (GUI) based and feature WYSIWYG diagram editing.

The following is a technology component standard for Diagramming.

<b>Table PLA-S-22: Diagramming Technology Component Standard</b> <i>New: January 15, 2010</i>	
<b>Strategic:</b>	<p>Microsoft Office Visio: Standard and Professional editions (highest version evaluated and tested for the environment and earlier versions that still have Microsoft mainstream support)</p> <p>Microsoft Visio Viewer (highest version evaluated and tested for the environment and earlier versions that still have Microsoft Office Visio mainstream support)</p>
<b>Emerging:</b>	
<b>Transitional/Contained:</b>	All Microsoft Office Visio and Visio Viewer versions that Microsoft Office Visio is in its extended (security hotfixes still available) support life cycle
<b>Obsolescent/Rejected:</b>	All Microsoft Office Visio and Visio Viewer versions that no longer have Microsoft Office Visio extended support (beyond support life cycle)

## File Compression

Compressing or “zipping” a file is a technique that can create a considerably smaller version of the original file. Zipped (.zip) versions of large files can have a reduced file size of up to 80 percent. Many zip utilities can create a self-extracting archive. These are archives that compress and package the files as an executable (.exe) file that when “clicked” to open will extract the files to re-produce the original files. Many zip utilities also allow you to encrypt files and protect sensitive data, especially when it is sent as an e-mail attachment.

<b>Table PLA-S-23: File Compression Technology Component Standard</b> <i>New: January 15, 2010</i>	
<b>Strategic:</b>	Microsoft Windows file compression (included with operating systems starting with Windows XP) WinZip when used to encrypt data exchanges
<b>Emerging:</b>	
<b>Transitional/Contained:</b>	
<b>Obsolescent/Rejected:</b>	WinZip when not used to encrypt data exchanges