



Office of the CIO
Technology Directive

NUMBER:
TD 11-05

SUBJECT: Server Virtualization	DATE ISSUED: TBD	DATE REVISED:
	EXPIRES: UNTIL RESCINDED	
	CIO PROGRAM: ENTERPRISE INITIATIVES & STRATEGIC PLANNING	

<p>REFERENCES:</p> <ul style="list-style-type: none"> • CEO Countywide IT Initiatives  Countywide IT Initiatives 022412.pd • NIST SP 800-34 Rev. 1 http://csrc.nist.gov/publications/nistpubs/800-34-rev1/sp800-34-rev1_errata-Nov11-2010.pdf • FIPS Pub 199 http://csrc.nist.gov/publications/fips/fips199/FIPS-PUB-199-final.pdf

Distribution Board Information Technology Deputies
 CEO Executive Committee
 Department Heads and Chief Deputies
 CIO Council
 CIO Council Leadership Committee

- Purposes**
1. To increase operational efficiencies of the County’s computing resources and reduce licensing costs;
 2. To drive down future costs related to equipment refresh activities;
 3. To reduce power consumption and computing space requirements;
 4. To enable other Countywide information technology (IT) initiatives that rely upon virtualized servers.
 5. To address the County’s data center and disaster recovery (DR) needs in a more consistent, affordable, and equitable manner;
 6. To formally establish server virtualization as an established Countywide technology infrastructure best practice; and
 7. To complete the implementation of purchased virtualization software.

Background & Server virtualization allows for multiple physical server computers and their

Context

operating systems and applications to be consolidated into fewer, higher capacity servers, allowing for more efficient usage of computing resources. This consolidation reduces the physical server inventory, which in turn reduces cost, footprint, and power consumption. It also enables faster and more cost-effective disaster recovery options than with traditional physical server computing.

In February 2012, the CEO, working with the Board Chief Deputies, established a set of priority Countywide IT Initiatives, which included server virtualization. Virtualization is key to other Countywide IT Initiatives, including the new Countywide data center, consolidated disaster recovery for County data, Countywide E-mail System, and IT Shared Services.

To cost-effectively speed the adoption and optimization of server virtualization, the County established an enterprise license agreement (ELA) with VMware, initially planned for use by 14 County departments, which provided software and technical services. However, progress toward implementing the software and completing virtualization has varied by department based on budget, technical resources, and departmental priorities.

Initial individual assessments of the remaining departments' server environments to determine which applications and physical servers can be consolidated are underway, along with general familiarization of departmental IT staff on server virtualization.

The Internal Services Department (ISD) has deployed a scalable, shared virtual computing infrastructure that is replacing its dedicated, multiple physical server hosting model. In addition to reducing costs through virtualizing the server environment, the ISD shared virtualization infrastructure provides disaster recovery, information security, and the capability to support multiple departments under the same virtualized infrastructure (multi-tenancy). As of October 2012, ISD has virtualized approximately 87% of its physical, shared infrastructure servers to the new environment.

Directive**Server Virtualization**

All County departments shall virtualize their servers to reduce hardware and software costs, computing footprint, and power consumption. All physical servers capable of virtualization must be virtualized by no later than June 30, 2014.

Departments shall meet with CIO to review their server virtualization project plans and current progress to ensure they comply with the virtualization

deadline and the remaining portions of this Technology Directive.

Data Center Hosting Minimum Requirements

In addition to reducing the number of physical servers through virtualization, the location and disaster recovery architecture for virtual host servers must be considered as well. Virtualized servers supporting applications determined by the Department to be “Mission Critical” (or classified as having “High” FIPS 199 Availability Impact Level) or “Important” (having “Moderate” FIPS 199 Availability Impact Level) shall be located in commensurate facilities with appropriate backup and recovery strategies. Based on recommendations in NIST SP 800-34 and the County’s IT disaster recovery plans, Departments should ensure that:

- “Mission Critical” applications are hosted in a TIA-942 Tier 2 or higher data center with a hot recovery site and with real-time or near-real time replicated storage at the recovery site. The data center should have a minimum of 99.741 percent availability with no more than 22.0 hours of downtime per year. Appropriate resources and procedures should be in place to allow for recovery of these applications within their Maximum Tolerable Downtime (MTD), generally within hours of an outage or disaster.
- “Important” applications are hosted in a TIA-942 Tier 1 or higher data center with a cold or warm recovery site and storage backups to the recovery site. The data center should have a minimum of 99.671 percent availability with no more than 28.8 hours of downtime per year. Appropriate resources and procedures should be in place to allow for recovery of these applications within their MTD, generally within days of—but not more than one week after—an outage or disaster.

Departments shall show compliance with these hosting minimum requirements to the CIO. Departments not in compliance shall present plans to the CIO for approval that include the timeframes, resources required, and alternatives explored in order to comply with the requirements. ISD’s shared virtualization infrastructure meets these minimum requirements, and departments unable to do so in a cost-effective manner are directed to first consider ISD for virtualized server hosting.

Reporting

All County departments that have not completed their server virtualizations shall report on their progress to CIO at least once per quarter for roll-up reporting to the CEO and status reports to the Board.

Software Licensing

Any County department utilizing VMware virtualization software outside of the established County ELA (e.g., acquired through a third-party) shall contact the CIO to plan for either release of those licenses or migration of those licenses to the ELA.

Software, Hardware, Maintenance, Training, and Professional Services

The CIO shall review and approve all expenditures of virtualization-related hardware, software, licenses, maintenance, training, and professional services to ensure compliance with this Technology Directive. This review and approval is in addition to any other reviews or approvals required for these purchases.

Non-Virtualized Servers

Any new, non-virtualized server procurements shall be reviewed and approved by the CIO. These procurements must include justifications on how the physical servers cannot be virtualized, how the procurement is consistent with the department's server virtualization plan, and with this Technology Directive. This review and approval is in addition to any other review or approval required for these purchases.

Scope & Applicability

This Technology Directive applies to all departments. The scope is x86 architecture-based server computers at this time.

Exceptions

Requests for exceptions to this Technology Directive shall be reviewed and approved by the CIO with notification to the CEO.

Departments requesting exceptions shall document and submit their requests to the CIO. The request should specifically state the scope of the exception along with the justification for granting the exception, the potential impact(s) and risk(s) granting the exception, costs and timeframes for complying with the policies set forth herein.

Exception requests should explicitly address the requirements in the "Data Center Hosting Minimum Requirements" and state the current and future costs of the exempted server infrastructure.

Although some software providers will inform departments that their applications must run on dedicated servers, departments must validate this information before requesting an exception.

Definitions

FIPS 199 – Federal Information Processing Standards Publication 199,

Standards for Security Categorization of Federal Information and Information Systems. In context of this Directive, the definitions of Availability (“Ensuring timely and reliable access to and use of information.”) closely correspond to the County’s three disaster recovery availability classifications.

NIST SP 800-34 – National Institute of Standards and Technology’s Special Publication 800-34, *Contingency Planning Guide for Federal Information Systems.* In context of this Directive, Sections 3.4 and 5 of 800-34 Rev. 1 discuss some of the disaster recovery planning considerations based on application criticality.

Server Virtualization – Merger of many standalone physical computer server systems onto fewer larger servers that maximize compute resources and reduces power and cooling requirements.

TIA-942 – Telecommunications Industry Association standard for data center telecommunications cabling and related facilities. Most relevant to this Directive is the tiered classification of data centers by facility availability and redundancy.

x86 Server – Servers running non-virtualized computer operating systems (i.e., Microsoft Windows and Linux) based on the x86 computing processor architecture developed by Intel Corporation.

Approved

Richard Sanchez, Chief Information Officer
County of Los Angeles

Please contact the Office of the CIO (213.253.5600 or info@cio.lacounty.gov) for questions concerning this Technology Directive. This document is also available online at <http://ciointranet.lacounty.gov/>

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