

Enterprise IT Shared Services Service Level Agreement



Enterprise Data Center Service Details

(Revision Date: 5/13/2011)

DOCUMENT CONTROL

REVISION HISTORY

<i>DATE</i>	<i>DESCRIPTION</i>
<i>9.15.10</i>	<i>INITIAL RELEASE</i>
<i>10.7.10</i>	<i>UPDATE ROLES AND RESPONSIBILITIES</i>
<i>05.03.11</i>	<i>UPDATE CUSTOMER RESPONSIBILITY FOR SILVER SUPPORT. MODIFIED ENTERPRISE</i>

	<i>SYSTEMS MANAGEMENT CAPABILITIES AND TERMS</i>

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INTRODUCTION

The purpose of this document is to provide detailed Service Level Agreement (SLA) information about the Enterprise Data Center Services.

CIO/OFT provides a full-scale solution that saves you the expense, risks, and hassle of designing, building and operating your own data center. CIO/OFT provides a highly secure, robust and flexible managed hosting service for over 25 agencies, while maintaining aggressive plans for delivering the most cost-effective infrastructure solutions.

This document is part of a set of SLA documents, and part of a group of documents and web pages that contain information about the Enterprise Data Center Services. The Resources Section of this document provides links to Enterprise Data Center resources.

SERVICE DETAILS - MAINFRAME

CONSOLE MONITORING

Console Monitoring ensures a customer's mainframe computer systems are effectively monitored and appropriate agreed upon actions or escalations are taken. CIO/OFT console operators will check for system availability; check tape and printer resources; answer system messages; execute scripts to monitor system resources and system health; and perform system checklists.

Operators will start up or shut down systems as necessary to respond to both normal and abnormal situations based upon defined procedures or under the direction of CIO/OFT technical staff.

For any hardware problem, vendor staff will be dispatched and the performance monitored. Operators will address specific questions from key users and work with the Enterprise Help Desk to address Severity-1 and Severity-2 problems. Operators will participate in developing and identifying mainframe abnormalities in the daily shift reports. The reports will be sent via e-mail to a customer in the morning every 24 hours, Monday through Friday, non-holidays.

CIO/OFT will notify customers of scheduled and unscheduled downtime events. Notification of users and interface agencies of these events will be mutually agreed upon by the customer and CIO/OFT.

MAINFRAME SOFTWARE INSTALLATION/MAINTENANCE

CIO/OFT installs and maintains a wide selection of software to meet a customer's needs. CIO/OFT will meet regularly with Agencies to discuss possible upcoming operating system and software upgrades that may impact Agencies and negotiate a schedule that is mutually agreeable.

CIO/OFT systems programming staff will procure, review, configure, generate, install, upgrade, and maintain all mainframe operating system software, systems utilities, and Independent Software Vendor supplied software. CIO/OFT will install the operating system, libraries, and components and apply patches and upgrades as needed.

CIO/OFT systems programming staff will review, configure, generate, install, and maintain vendor-supplied software products and all mainframe-based telecommunications software unless specifically agreed upon otherwise with the customer. Software product customization responsibilities are based on agreed upon responsibilities with a customer.

To request new software, a customer should submit a formal request to the Data Center. Customer requests for new software will be analyzed for appropriateness to the overall mainframe architecture and the CIO/OFT Enterprise Architecture. CIO/OFT will review the cost impact, if any.

CIO/OFT and the customer will do appropriate testing of modifications prior to, when possible, and during, implementation of modifications. The testing plan will be agreed to on a project by project basis. CIO/OFT will diagnose software problems based on agreed upon responsibilities with the customer, acquire any associated software fixes, apply the fixes, and work with the customer to test any applied fixes.

MAINFRAME PERFORMANCE AND CAPACITY PLANNING

CIO/OFT will monitor performance and capacity of mainframe systems to ensure systems perform effectively. To meet mutually defined performance level goals of CIO/OFT and the customer, CIO/OFT technical support staff will monitor system use and perform tuning efforts to ensure mainframe system resources are available to customer environments.

CIO/OFT will periodically solicit information from a customer regarding new initiatives or changes in processing that may cause a deviation in resource consumption beyond historical trends. System configurations will be adjusted as necessary to accommodate these changes and provide performance levels mutually agreed upon to meet customer needs.

The customer is responsible for notifying CIO/OFT of projected major changes in resource consumption, including changes that have a significant effect on system use, such as tape, print, batch, processing flow, new programs or modifications in transaction volumes.

MAINFRAME TAPE SERVICES

CIO/OFT provides multiple services to handle usage and management of mainframe tape media. CIO/OFT will establish and publish supported media. Additional fees may apply for non-standard media. CIO/OFT will provide customers at least 6 months of transition period to a new medium when a medium is out-of-date and will no longer be supported. The services are available based on the customer's agreed upon mainframe console hours of operation.

Manual Tape Processing

The service includes responding to all system, application, job, and user requests for manual tape mounts and dismounts on a variety of tape drives. As tapes are removed or deleted from the system, each is degaussed and/or destroyed according to defined security procedures.

Robotic Tape Processing

The service includes adding physical and virtual volumes and ejecting volumes to/from the Virtual Tape Systems or Automated Tape Libraries as needed or requested.

Tape Library

Tapes are received and tracked as they enter the Data Center. Foreign tapes may be accepted from other sources established with the Data Center by the customer. Periodically, foreign tapes are reviewed and returned to the customer after processing. Tapes sent offsite are tracked for eventual return to the library. Tapes are recycled and historical reports are maintained per customer standard. Transportation of tapes is the responsibility of the customer with the exception of Agencies who participate in the CIO/OFT Iron Mountain contract. Physical audits of manual tapes are conducted annually and results are shared with customers.

Full Backup Library Services

The services include: ensuring customer backup procedures are run; identifying tapes to be sent offsite; using offsite system vaulting software to enter tapes being sent offsite and requesting tapes to be returned; tracking vaulted tapes and ensuring that the correct generations are offsite and that the correct generations are returned to the Data Center; and ensuring that long-term vaulted tapes are returned to the Data Center at correct intervals for copy or creation of new tape. Cost for the service is included in the manual tape mounting fee.

Limited Backup Library Services

Limited services include: ensuring customer backup procedures are run; identifying tapes to be sent offsite; and packaging and returning tapes to the customer. Cost for this service is included in the manual tape mounting fee.

Tape Ejection

The service consists of entering ejection commands to the robotic tape drives and manually removing tapes to be sent to offsite storage.

IBM ONLINE REPORT VIEWING

With the service, a customer receives the benefit of fully managed report viewing and distribution environment. CIO/OFT will manage the operating system, storage subsystem, database management system, and network connectivity. CIO/OFT will also provide and manage the report viewing and distribution subsystem components allowing the customer to focus support efforts on managing report requirements. The customer will be responsible for defining reports to the system, including report attributes and retention criteria. The customer will also provide access and training to the user community and administrative support (add users, delete users, and reset passwords). The customer will define backup criteria and archival needs.

The Report Viewing and Distribution service offering provides:

- Integration of data created by application programs into an online, electronic information archive and retrieval system
- Controlled and reliable access to all of an organization's reports
- High volume capture of computer output
- Advanced ready-to-use client viewing applications for both desktops and standard Web browsers
- Automated storage management
- Advanced search and report-mining capabilities

CIO/OFT Data Center staff will be available to report and correct performance problems and concerns. The service is available 24x7.

PRODUCTION CONTROL SERVICES

Schedule and Set Up

The service is available from 7 A.M. to 3:15 P.M., Monday through Friday, non-holidays only. The service includes setup and scheduling of daily, weekly, monthly, quarterly, annual, and ad-hoc jobs. Jobs that 'error' or require quality control (e.g. validate hash totals) will be addressed with customer programming staff during Standard Business Hours. The job is performed using detailed knowledge of a customer's work, job control language, and applicable scheduling software. CIO/OFT staff have a working knowledge of the relationships among various programs and customer applications.

Batch Monitoring and Error Resolution

The service is only available to a customer receiving Production Control services. CIO/OFT staff will monitor the execution of production batch schedules on off-shifts. Job errors will be addressed as follows: by modifying JCL/ECL (job control language/executive control language), using customer escalation procedures, or following job documentation. Schedules will be modified as necessary to insure timely completion of customer workloads. Control totals will be monitored. The job is performed using detailed knowledge of a customer's work, job control language and applicable scheduling software. CIO/OFT staff have a working knowledge of the relationships among various programs and customer applications.

Batch Schedules

Console staff serve to manually initiate batch schedules and the service includes starting a maximum of thirty (30) schedules per day. Some critical checks (fewer than 10 jobs) are performed from one job to another and limited totals are validated; the critical batch jobs are monitored and addressed per documentation.

ASSOCIATED PRINT SERVICES

CIO/OFT provides multiple services to support printing needs.

Customer Stock Storage

The CIO/OFT print center will maintain limited storage space for customer print stock. Up to a two-week supply can be stored. If additional space is needed, there may be a cost based on square footage and requirements for secure/non-secure storage.

Burst/Trim/Decollate

Bursting is the process that separates continuous form paper into individual sheets. Trimming separates pin feed strips from continuous form paper. Decollating separates multiple part forms into individual continuous parts.

Packaging

Packaging includes any special print separation, sorting and breakdown of output, shrink-wrapping and placing output in envelopes or delivery boxes.

Mailing

The service includes preparation of print for the U.S. mail or courier services including addressing envelopes/boxes.

Delivery

The delivery service moves packaged print from the print center to a customer destination at determined frequency.

Forms Design

The service provides support to the user community in the design of laser-generated forms, fonts, and logos. CIO/OFT staff will create job source and form source language, use print and form design languages, scan source documents and place the forms in server folders. Forms are edited for print quality and tested in conjunction with the user; once approved the documentation is created and placed into the documentation library. The documentation contains the form number, name, edition date, paper size and color along with printing and finishing instructions.

Availability of services will continue for customers using this service, as agreed upon between CIO/OFT and the customer. The service is grandfathered in at the time of transfer to CIO/OFT. It may not be expanded or modified. Components or particular jobs can be deleted and once removed cannot be replaced.

IBM MAINFRAME DISASTER RECOVERY

The service provides a production ready mainframe environment at a local CIO/OFT designated Recovery Data Center facility. In the event of a disaster at the production site, recovery shall occur within a Recovery Time Objective of 48 hours. The prioritization of participating customers will be determined at the time of the disaster and will remain the discretion of CIO/OFT Executive Management.

CIO/OFT will provide the following mainframe resources and support services within 24 to 48 hours after CIO/OFT and the participating customer officially declare a disaster:

- Mainframe computer resources at the Recovery Data Center
 - Equivalent CPU and memory capacity
 - Equal production DASD Capacity
 - Equivalent Tape Capacity
- Infrastructure support services
 - Redundant networking infrastructure required to support mainframe execution at the Recovery Data Center
- Network Services to the Mainframe LPAR
 - Connection to the customer's current entry point to the Home and Recovery Data Center
 - Connection to the customer's current critical business constituents from the Home and Recovery Data Center
- An operational mainframe environment in a customer-familiar configuration
 - Recovery LPARs containing the appropriate hardware resources (CPUs, Memory, co-processors, etc.) predefined and maintained at the Recovery Data Center
 - OS and operational software (including production components, configuration, programs, and customization) maintained at the Recovery Data Center
 - Restoration of user programs and data with a recovery point to the last successful replication
- Operational and Technical support of the customer's mainframe resident environment available at the Recovery Data Center

- Facilities supporting the Recovery environment maintained by CIO/OFT
- A mainframe specific DR Plan particular to the customer maintained and exercised

A CIO/OFT mainframe DR technical coordinator will be assigned to each customer to:

- Be the point of contact between CIO/OFT and the customer
- Coordinate exercises
- Be responsible for maintaining CIO/OFT's mainframe recovery documentation

CIO/OFT will maintain a Recovery environment consisting of:

- Sufficient DASD to support the largest subscribing customer. For the customer Disaster Recovery Test, CIO/OFT will Flash Copy the Mirrored IBM DASD to isolate the test environment from the Production mirrored data at the Recovery Data Center
- Connectivity to the Mirrored DASD. The Flash Copy DASD will be established and maintained by CIO/OFT.
- Operations and technical support for an customer Disaster Recovery Test

Participating customers are responsible for the following aspects of their disaster recovery operations:

- Development and implementation of their DR plan and processes to recover at the Recovery Data Center
- Designation and management of necessary DR Resources at customer locations needed to support the recovery strategy
- All end user and non-Data Center vendor coordination
- Customer-managed network failover configuration and activation during a disaster to the Recovery Data Center
- Application and data recovery validation (e.g. recovery of databases, data to sync-point, in-flight transaction recovery)
- Interaction with dependent systems (including vendors)
- Management of non-virtual and offsite tape data entities (e.g. off-site storage, retrieval and delivery to the recovery site are the customers responsibility; Non-virtual *native* tapes retained solely at the primary site will not be accessible to the recovery site)
- Application Data Backups at the Recovery Site
- Designating a customer DR Coordinator who will:
 - Be the point of contact between the customer and CIO/OFT
 - Coordinate exercises

- Be responsible for maintaining customer recovery documentation

To participate in this program, a customer must consent to the following terms of service:

- The preceding list of customer responsibilities
- A minimum commitment of 3 consecutive years to the service
- Mirroring all production data, including System Volumes, on IBM DASD at a designated Recovery Data Center
- A commitment to participate and perform disaster recovery tests once every 12 months during the service offering period

The customer will be charged a one-time setup fee for the service. There will be a monthly charge for the ongoing customer mirrored DASD and an additional charge for 'Flash-copied' DASD Storage during the month of the conducted test. The cost of any unique, non standard equipment needed exclusively for the particular customer is also the customer's responsibility.

Disaster Recovery services are available when a formal disaster is declared based upon the escalation procedures agreed to by CIO/OFT and the customer. Recovery System availability will be based on the customer's agreed upon mainframe console hours of operation.

SERVICE DETAILS – DISTRIBUTED SYSTEMS

CENTRAL SERVER HOSTING

CIO/OFT hosts and monitors servers in the CIO/OFT Data Center. CIO/OFT will coordinate and schedule the installation, configuration and maintenance of hardware and operating system software for open systems servers residing in the CIO/OFT Data Center, including any problem diagnosis associated with this environment. The focus is on providing a stable environment where servers reside, in addition to providing appropriate levels of administration and monitoring to meet specific needs of each customer.

CIO/OFT provides three support levels for Central Server Hosting as follows:

Support Level	Enterprise Systems Monitoring (ESM) Coverage	Response
Platinum	7 x 24	Two hour initial response to Severity 1 and Severity 2 Tickets
Gold	Monday-Friday 7 A.M. – 5 P.M.	Two hour initial response to Severity 1 and Severity 2 Tickets during the monitored window, otherwise next business day
Silver	Not monitored	Best effort, business hours only

CIO/OFT provides the following for Platinum, Gold and Silver Support:

- Preparation and submittal to the customer of a Project Support Proposal (PSP) outlining the server support level being applied and support costs associated with the servers. Work will not proceed until the customer’s IT and Finance Directors have approved the proposal
- Environmental Management including power, cooling, physical security, coordination of installation, and cabling of new equipment in the CIO/OFT Data Center
- Technical consulting – limited by staff availability – including design and integration of hardware and software infrastructure and implementation of the design
- Comprehensive Operating System (OS) administration and maintenance including monitoring and application of patches and upgrades as available, security upgrades, server hardening, virus protection, and enterprise back-up client installation
- Notification to the customer when patches need to be applied. CIO/OFT will review patches with the customer and jointly schedule the work. This work is typically scheduled for the

standard CIO/OFT maintenance windows: Wednesdays and Fridays from 5am to 7 AM.
CIO/OFT admins will perform the patch upgrades.

- Change control processes for all CIO/OFT supported components will be followed.
- Full support for CIO/OFT provided shared services such as, but not limited to authentication services, DNS and NTP
- Full Data Center network support for all networking components within the defined Data Center network
- Establishment and maintenance of approved firewall rules, routing and VPN tunnels to ensure application connectivity and ensure a secure network environment
- Load balancing services based on documented rules for use
- Backup and recovery as defined in the Open Systems Backup Service Level Agreement (SLA)
- Working with customer network support staff, or CIO/OFT Customer Network Services if the customer network is maintained by CIO/OFT, to establish network connectivity
- Provide operational support for the server and applications via the Customer Care Center (CCC) ticketing system. Tickets will be created by both the monitoring systems (if applicable based on support level) and by customer calls to the CCC help desk. As applications are deployed, IATS and the CCC will work with the customer to review troubleshooting scripts for the application. These scripts will be used to triage and dispatch support calls to the customer's application team as well as CIO/OFT support teams as appropriate.

CIO/OFT also provides the following with Platinum and Gold Support:

- Enterprise Systems Monitoring of servers using a CIO/OFT-defined Tivoli architecture supported by the CIO/OFT SDC operational staff consistent with the support level designated
- Basic performance monitoring and analysis of operating system and network components
- Review of application software requirements to evaluate roles and responsibilities for application installation, configuration, and ongoing application software maintenance. Those components, including patches, fixes, and upgrades, which cannot technically be administered at the customer level, can be administered by Infrastructure, Architecture, and Technical Support (IATS) if deemed appropriate.
- Installation and configuration of ESM agents to facilitate monitoring
- Defining and implementing appropriate system management alerts and notifications to CIO/OFT and customer application and database staff in conjunction with customer staff
- Providing Level II and Level III response to CCC tickets, as appropriate, to ESM alerts related to hardware and the operating system
- Technical consulting and project team participation, limited to staff availability
- Meeting with customers, prior to implementation, to create troubleshooting scripts to expedite and route issues to the appropriate group for resolution

CIO/OFT provides the following for Silver Support:

- Administrative privileges on the server upon request. Silver Support is not available for production servers.
- For those devices for which the customer has administrative privileges CIO/OFT troubleshooting support will be limited to restoring server state to a date specified by the customer once such has been turned over to the customer.
- Restorations will be serviced as a next business day request.
- Provisioning the OS and other CIO/OFT services as appropriate. Functionality will be confirmed prior to release to the customer.
- The customer assumes all responsibility for installation and maintenance of customer required software components.

Standard Tivoli Monitoring for Platinum and Gold Support Servers

Tivoli monitoring is a required service for all production servers in the CIO/OFT Data Center. Through the use of Tivoli monitoring software, the data center infrastructure that end user applications run on is continually monitored and, when necessary, alerts are generated to initiate corrective or pro-active actions.

The Tivoli products utilized for the service include:

- Tivoli OMNIBus – Functions as event correlation engine and operations interface. All defined enterprise significant events are sent to OMNIBus for correlation and further action. Performance monitoring and analysis limited to staff availability.
- IBM Tivoli Monitoring (ITM) – Used to monitor software components of Unix and Windows servers
- IBM Tivoli Netview – Used to monitor all data communications components of the data center network for availability

CIO/OFT is responsible for:

- Providing base level monitoring and alerting on all servers
- Providing hardware monitoring for all IBM X86 windows servers
- Providing availability monitoring for data communications equipment
- Providing a consolidated core infrastructure that all enterprise significant alerts will be integrated into for consolidation and to initiate corrective actions

- Working with CIO/OFT system administrators and customer subject matter experts to modify or enhance monitoring. Note: Performance monitoring and analysis limited to staff availability.
- Providing a centralized infrastructure to collect and display utilization information for servers using the IBM Tivoli product set

Participating Customers will be responsible for the following:

- Working with CIO/OFT to set up customer and application specific monitoring.

Base monitoring for Windows Servers includes:

- Processor (CPU) Monitoring
 - Measures overall system processor utilization; generates alerts when the CPU's are too busy.
- Memory Monitoring
 - Measures memory usage and paging, generates alerts as follows:
 - Low cache read hits
 - Low available memory
 - Excessive paging
 - System leaking memory
 - System Drivers leaking memory
- Logical Disk Monitoring
 - Measures the performance of each logical disk; generates alerts as follows:
 - High percent disk time
 - Low logical space
- Service Monitoring
 - Ensures that key services are running; generate alerts as follows:
 - Service stopped
- Process Monitoring
 - Measures process CPU usage
- Windows Event log monitoring

Captures System and Application error log entries, and selected others. These entries are available for review in the Administrator's OMNibus console GUI. Selected entries generate email alerts, or are displayed upon the Command Center OMNibus console for immediate action.

Base monitoring for Unix and Linux servers includes:

- Processor (CPU) Monitoring
 - Measures overall system processor utilization and processor run queues generates alerts when the CPU's are too busy and queues are too long.
 - Subject to the availability of required information, monitors presence of individual CPUs.
- Memory Monitoring
 - Measures memory usage and swapping, generates alerts as follows:
 - Low memory
 - Low swap space
 - Thrashing (excessive swapping)
- File System Monitoring
 - Measures available resources:
 - Available space
- Security Monitoring – key files
 - Ensures the presence of key system security files
 - Generates a notification when they are updated

Security Monitoring

- Checks for the following items that can indicate security breaches:
 - Missing files
 - Property changes for key files
 - Suspect Superuser
 - Invalid root account
 - Duplicate User accounts
 - Excessive root log-ins
- Process Monitoring
 - Ensures that key Processes are running, generate alerts when processes are missing

The following defines customer responsibilities for all customer-owned servers:

- Full database administration, including database backups to disk and database restorations
- Data Security and Integrity
- Testing and Quality Assurance of application code prior to migration to production environments

- Provide at least one pre-production environment to be managed by the Data Center to be used for migrations and testing of patches
- Provide application testing in the event of scheduled infrastructure downtime
- Provide customer resolver support and response, as appropriate, to ESM alerts related to applications
- Maintain current maintenance contracts on all hardware and software owned by the customer and managed by the CIO/OFT
- Installation, configuration, and maintenance of all software above the OS including the application of patches and upgrades
- Management scripting
- Application migration support
- Provide a technical support contact for Level II and Level III technical problem resolution

CIO/OFT will issue a proposal for central server hosting within thirty (30) days of receiving a request for the service.

The following defines the additional customer responsibilities for Silver Support:

- Optional administrative rights
- Performance monitoring, analysis, and design
- Capacity planning in conjunction with data administration groups
- Participation in the CIO/OFT Change Control Management process

Patch Management

Windows servers (2003 and 2008) are patched monthly. Immediately after the standard monthly release, patches are downloaded and are applied to the servers during the normal maintenance windows (Wednesday/Friday, 5 A.M. to 7 A.M.). Change controls are generated for all servers being patched. Patch bundles are applied to non-production servers in the first windows of the cycle; it is expected that customers test their non-production environments and if issues are identified, IATS is notified. Barring any customer identified issues, all production servers are patched in the last several windows of the month. A clean up window is reserved to address any issue found during the regular monthly patching. Depending upon the timing of the release, emergency/urgent patches that are issued out-of-band are either rolled into the monthly cycle, or are scheduled separately.

IATS patching policy for the UNIX server infrastructure is to evaluate and apply patches on a semiannual basis. Admins for each of the supported operating systems evaluate the available patch bundles for the servers in their domain and determine the most appropriate, stable versions to be applied to the customers' servers. Planning for deployments include conversations

with the customer and are scheduled with change control requests. Where possible the patches are applied during the regular maintenance windows. Extended or non-standard maintenance windows may be required in order to support the deployment, validation and potential rollback. Non-production infrastructure is always patched prior to production.

For all servers, critical and high security alerts issued by vendors will be analyzed and deployed within 72 hours of receiving the alert from the vendor community. The schedule for distribution to servers will be communicated and tracked via change control. Patches identified as less than critical will be bundled and scheduled for deployment during normal maintenance windows as resources permit.

Patching for servers are typically scheduled during the standard maintenance windows. Wednesday and Friday, 5 A.M. – 7 A.M.

TURN-KEY SERVER HOSTING

Virtual server environments are provided to our customers on shared CIO/OFT hardware through Turn Key Server Hosting. By making use of this service, our customers can realize more rapid application deployments without the capital expenditures involved to purchase new physical servers.

Service Considerations:

- Operating System and any other software is not included
- Turn Key Servers require a minimum of 15GB of storage prior to application requirements.
- Enterprise backup services are available but not included.
- Where applicable support, backup, patch management and Enterprise Systems Monitoring will be provided consistent with the support level provided and will be consistent with the support level outlined for customer owned servers as outlined in pages 13-19 of this document.

CIO/OFT will issue a proposal for turn-key server hosting within thirty (30) days of receiving a request for this service.

The service is available with three different technical support options:

- **Silver Support** – Technical support is available from 7 A.M. until 5 P.M. Monday through Friday excluding state holidays. Servers with Silver Support are not monitored and initial response to issues is on a best-effort basis.

- **Gold Support** – Technical support is available from 7 A.M. until 5 P.M. Monday through Friday excluding state holidays. Servers with Gold Support are monitored 7 A.M. – 5 P.M. and initial response to Severity 1 and Severity 2 issues is within two (2) hours.
- **Platinum Support** – Technical support is available 7x24 including state holidays. Servers with Platinum Support are monitored 7x24 and initial response to Severity 1 and Severity 2 issues is within two (2) hours.

REVERSE PROXY

CIO/OFT will provide the customer with Reverse Proxy Services by identified Universal or Uniform Resource Locator (URL). Reverse Proxy Services enable an application that is *not* architected to terminate user sessions in Tier 1 of the network, to be implemented as if it were. The Reverse Proxy layer is added in front of the user presentation layer creating a buffer between more accessible Tier 1 facing the Internet or NYeNet, and more secure presentation and business logic layers in either Tier 2 or the Legacy Tier. The service enables our customers to migrate many more applications to the Internet, intranet and the new Data Center Network three tier architecture than they would be able to without this service. If an application is re-architected to no longer require the Reverse Proxy Service, the customer simply needs to contact CIO/OFT to terminate the service for the specified URL.

The service has the same availability as our Standard Support under Central Server Hosting: operational support for Enterprise Systems monitoring including Level II support is provided 24x7. On-site technical support is provided during Standard Business Hours.

OPEN SYSTEMS BACKUP

CIO/OFT will provide the centralized infrastructure (hardware & software) necessary to satisfy the customer's data backup and recovery requirements for data used in the Open Systems environment.

CIO/OFT will provide complete management of the backup and recovery infrastructure, which includes:

- **Configuration:** CIO/OFT technical support staff will install and configure the server backup application software. Staff will install or assist in the installation of the client agent software on CIO/OFT supported operating environments.
- **Monitoring:** CIO/OFT will monitor daily backups of customer server environments. CIO/OFT will monitor and restart failed backups. CIO/OFT will work with server administrators and the customer to resolve persistent backup related problems. CIO/OFT will actively monitor backup infrastructure (server, tape library, and storage network) and make sure resources are available to meet customer requirements.

- Recovery: CIO/OFT technical support staff will provide individual or complete server recovery services.
- Capacity Planning: CIO/OFT technical support staff will monitor backup infrastructure resource use (server, tape library, and networks) and reconfigure, tune or expand the infrastructure as necessary to make resources available to meet customer requirements.
- Media Management: CIO/OFT will provide media management services including recycling and replacement of tapes and development of an offsite tape service.

Open Systems Data Backup/Recovery Guideline Overview

All systems, applications, and databases supported will be protected against data loss by the use of regularly scheduled backups. This will be accomplished with standard backup procedures followed by the CIO/OFT, Infrastructure, Architecture, and Technical Support (IATS) systems group.¹

¹ This document is based on current CIO/OFT practices. For specific information regarding your environment please contact CIO/OFT IATS at "oft.dl.dc.iats.opensystems.TSM@cio.ny.gov"

Standard Data Backup Guideline:

Operating Systems, Application Software, and all other flat-file data structures: The data protection services provided for the Enterprise Open System Servers are:

- Data protection services are performed once every twenty-four hours. This captures changed data for that period.
- Backups are accomplished using industry standard vendor provided backup systems. The backup system provides data protection across local area network and storage area network (SAN).
- Backups are performed to centrally located tape storage pools. The backup service is automated, centrally scheduled, and policy based. Backup services are provided on currently supported Open Systems platforms that have the backup client software installed.
- CIO/OFT IATS backup administrators provide the client software and installation instruction.
- Files that are open in exclusive mode during the backup process are not backed up.

Database Backup

- On-line database backups are supported directly through backup software agents for the supported database vendor.
- On-line database backups directly to disk are supported and recommended.
- For database backups to disk:
 - The backup from database backup utilities should be placed as flat files on external disk.
 - Tape backup of the extracted database flat files will be performed on a daily basis.
- For "Cold Backups" of databases the customer must schedule sufficient outage time of the application during a backup window. ("Cold Backups" require that the database application is shutdown completely and no database activity takes place during the backup process.) Appropriate scripts will be developed in conjunction with the Customer to stop and start database services.

Business Resumption Guideline

- Recovery services include the full range of requirements from single files to complete server rebuilds.
- Recovery will be performed on first come first served basis unless over-ridden by priority mandates and/or resource availability.

- Example: Production database restore will command priority over a development or simple file restore request.

NOTE: To request a restoration, customers should contact the CIO/OFT Customer Care Center (CCC) at: 1-800-697-1323. The CCC will issue a ticket number for the request and keep the customer up-to-date on the process.

Media Retention Guideline

- Media containing backups will be retained for thirty days (30). Different retention periods would require OFT and customer financial signoff.

Media Duplication for Offsite Protection Guideline

- Tape off-site services are currently not performed or included as part of the Open Systems backup and restore service.
- OFT is currently investigating tape off-site technology and services for Open Systems backups.

Customer Requirements

- The Customer will provide and document their backup requirements if different from the Open Systems Data Backup/Recovery Guidelines. The Customer will provide annual estimates of data growth for its applications in order to allow for enterprise backup architecture capacity planning.
- The Customer staff responsible for database administration will collaborate with the OFT/IATS to ensure that adequate resources are available to fulfill their on-line backup and recovery requirements.
- The Customer will write and support all on-line backup scripts. All script notification and scheduling is the responsibility of the Customer.
- The Customer is encouraged to schedule all scripts for database backup to disk using Data Center Production Control run-books for Tivoli Workload scheduler.
- The Customer is responsible for the administration of their database and the data that resides within them. The Customer manages and provides all policies and services for the backup and recovery of their individual database instances.
- The Customer database administrator is responsible for cleaning the flat file repository.

Most backup functions are automated and occur during the customer's off-hours of operation based upon agreement with the customer. Support for backup is available during Standard Business Hours for technical support staff. Emergency restoration will be handled through the standard CIO/OFT Enterprise Helpdesk process.

APPLICATION APPLIANCE HOSTING

CIO/OFT hosts and monitors application appliances in the CIO/OFT Data Center. CIO/OFT will coordinate and schedule the installation, configuration and maintenance of hardware application appliances residing in the CIO/OFT Data Center, including any problem diagnosis associated with this environment. The focus is on providing a stable environment where application appliances reside, in addition to providing appropriate levels of administration and monitoring to meet specific needs of each customer.

The following defines the CIO/OFT responsibilities for the hosting of application appliances:

- Conduct an architectural review to determine appropriate placement
- Coordinate ERB process and follow-through
- Networking form (Firewall, IP, CSS, etc.) submittal, coordination, and follow-through
- Partner with customer on initial provisioning and testing
- Work with customer and vendor to determine and document strategy for monitoring of the appliance
- Based on documented monitoring strategy, respond to monitored events which may relate to physical infrastructure, including but not limited to power, temperature, and network connectivity
- After validating the infrastructure, if IATS determines there is a potential issue with the appliance hardware, a ticket will be opened and referred to the customer for dispatch to the vendor.

The following defines customer responsibilities for the hosting of application appliances:

- Involve IATS in the decision to pursue purchase of the appliance
- Provide detail requirements for the proper functioning of the appliance
- Provide detailed vendor maintenance information and maintain an active support contract
- Partner with IATS on initial provisioning and testing
- Configure the appliance's "application" and provide all support thereto related to the functioning of that application
- Work with IATS and vendor to determine and document strategy for monitoring of appliance
- Based on documented monitoring strategy, respond to monitored events which relate to application services provided by the appliance
- Implement a backup and recovery solution and be responsible for maintaining the backups and restores
- Customer will initiate all vendor support calls. IATS will act as the liaison for all physical infrastructure and connectivity verification.

SERVER VIRTUALIZATION USING VMWARE

Virtualization technology offers CIO/OFT customers a way to drive improvements in capital and operational efficiency. By leveraging VMWare virtual servers, customers can better manage server capacities and often streamline server provisioning processes.

CIO/OFT provides the following services with Basic and Standard Support:

- VMWare Host (ESX) Configuration - The implementation of a VMWare Host system consistent with the Terms of Service for Central Server Hosting.
- VMWare Guest (Virtual Machine) Configuration - CIO/OFT will make use of Virtual Center and other tools to configure and provision requested Virtual Guests. The Virtual Guest will be configured based upon the requirements set forth in the Project Support Proposal (PSP) and other service request documentation consistent with the Terms of Service for Central Server Hosting.
- Manual VMWare Guest Relocation (VMotion) - In the event that a virtual guest must be relocated to another ESX server in response to maintenance or capacity issues, CIO/OFT will schedule the movement of that guest and facilitate the relocation via VMotion. Any customers wishing to make use of VMotion will be asked to provide detailed configuration instructions based upon their specific server requirements. CIO/OFT will configure VMotion based solely on the configurations set forth in these instructions. Any request to initiate VMotion should begin with an Open Systems Work Request or, if more immediate action is required, an Enterprise Help Desk Ticket.
- Distributed Resource Scheduling (DRS Load Balancing) – DRS is used to balance load by dynamically distributing virtual guests across multiple physical servers. Any customers wishing to make use of DRS will be asked to provide detailed configuration instructions based upon their specific server requirements. CIO/OFT will configure DRS based solely on the configurations set forth in these instructions. Any request to initiate DRS should begin with an Open Systems Work Request or, if more immediate action is required, an Enterprise Help Desk Ticket.
- VMWare High Availability (HA) – In the event that a VMWare host experiences a failure, guest servers can be configured to failover onto a different physical server. Any customers wishing to make use of HA functionality will be asked to provide detailed configuration instructions based upon their specific application requirements. CIO/OFT will configure HA based solely on the configurations set forth in these instructions. Any request to initiate HA should begin with an Open Systems Work Request or, if more immediate action is required, an Enterprise Help Desk Ticket.

Additional Information

In addition to the VMWare-specific services listed above, please reference the Centralized Server Hosting section of the Data Center Addendum for more details on centralized server

hosting and management services. CIO/OFT Data Center technical support staff must be involved with, and approve the design of any such specific services.

Design Criteria and Considerations

- Capacity Planning and Load Testing - With one of the principle goals of virtualization being the better use of hardware, it becomes even more important to fully understand the capacity requirements of applications. The capacity planning and load testing should be specifically designed to address the special requirements of a virtualized environment including the impact it will have on a network interface.
- DRS and HA Planning – In the event that DRS or HA configurations will be used anywhere within the VMWare cluster, it is critical that detailed planning be performed by the application owners to assess the impact a server move will have on that server and any others which share the same hardware.
- Storage Requirements - In addition to any normal disk storage that an application may require, disk capacity will also be required for the OS along with any memory that will be configured for use on the VMWare guest.
- Each guest operating system requires Enterprise Storage in the amounts below:

Linux

One vCPU and 2 Gb of Virtual Memory	38 GB
One Additional vCPU and 4 Gb of Virtual Memory	46 GB
Two Additional vCPUs and 8 Gb of Virtual Memory	58 GB

Windows

One vCPU and 2 Gb of Virtual Memory	30 GB
One Additional vCPU and 4 Gb of Virtual Memory	35 GB
Two Additional vCPUs and 8 Gb of Virtual Memory	40 GB

On-site technical support is provided during Standard Business Hours as indicated in the Core Terms of Service Document.

SERVICE DETAILS – PRINT SERVICES

Our Data Center centralized print services provide customers with services ranging from high volume laser printing to packaging, mailing and delivery with fast turnaround times, low prices and knowledgeable customer service.

CIO/OFT offers print services that provide high volume and high speed laser printing.

Standard Laser Print service includes the following laser paper types:

- White 8.5 x 11 cut sheet
- White roll paper
- White laser standard labels (Standard label size is 4" x 1 7/16")
- 3-hole punch white 8.5 x 11 cut sheet
- 3-hole punch white roll paper

Non-Standard Laser Print:

- A set up fee will be required for any non-standard laser paper. Storage is available for a limited amount of non-standard stock.

Impact Print

- An additional equipment fee will be applied for any print directed to the impact printers

CIO/OFT Operations staff will ensure that printers are properly maintained and monitored. Print consoles are used to direct output to the appropriate printer. Printer output is visually scanned for print quality and alignment. Documents are re-queued if necessary. CIO/OFT will interface with a maintenance provider for maintenance and problem resolution.

SERVICE DETAILS – DATA STORAGE

CIO/OFT will provide the Agency with storage resources (Storage Area Network [SAN] and Disk) required to meet business needs.

CIO/OFT will provide complete management of the SAN and Disk resources.

- **Provisioning:** Add or remove open systems servers from the SAN and/or allocate and reallocate disk volumes from servers or mainframe systems as required. Configure and expand storage network and disk resources as required.
- **Monitoring and Problem Resolution:** CIO/OFT will actively monitor the storage network and disk infrastructure for impending failures. CIO/OFT will resolve storage infrastructure problems and coordinate problem resolution with vendors when appropriate. CIO/OFT will work with vendors to upgrade firmware and patches associated with the SAN and Disk Subsystems as required.
- **Performance:** CIO/OFT will review the storage infrastructure performance within the SAN and Disk Subsystems. CIO/OFT will work with Agency and system administrators to identify storage related performance issues and resolve or recommend solutions.
- **Capacity Planning:** CIO/OFT will review storage infrastructure resource use and reconfigure, tune or expand the infrastructure as necessary to make resources available to meet Agency requirements.
- **Architecture and Design:** CIO/OFT will architect and design cost effective SAN and tiered disk solutions based on best practices for security, performance, availability, and scalability.
- **Reporting and Billing:** CIO/OFT will track disk resource use by Agency and provide monthly billing reports.

CIO/OFT offers the following types of Data Storage Services at specific rates:

Data Storage – IBM Tier 1

- IBM Tier 1 is designed for the highest availability and performance requirements. It is built on completely redundant components with features for online firmware upgrades to minimize downtime. It uses the most current disk technology and is based on a cache-centric design that provides fastest response times while sustaining a large number of data transfers.
- Tier 1 is most often selected for Business critical 24x7 Databases, file servers and e-mail applications as well as for I/O intensive applications such as data warehouses.
- Tier 1 is available to most Open Systems servers and to IBM mainframe operating environments.

Data Storage - Tier 3c

- Tier 3c is designed as inexpensive magnetic storage used for long-term storage of fixed content, archived or reference data. The storage is normally characterized by much lower performance than Tier 1 storage. Data in Tier 3c is automatically mirrored and does not require backup to tape.
- Tier 3c is most often selected for storage of images, documents, static content, archived data and reference data such as GIS data. It is recommended as the replacement for optical storage and for use with applications such as FileNet, Documentum, and IBM Content Manager.
- This tier is available to most Open Systems servers.

Data Storage - Tier 3i

- Tier 3i is designed as inexpensive magnetic storage used for test, quality assurance, development, or production application server environments. The storage is normally characterized by lower performance than Tier 1. It provides for the use of less expensive ATA disk drives and ethernet interfaces using the iSCSI protocol or as Network Attached Storage (NAS – NFS only). The Disk Subsystem uses a private, secure, and redundant Ethernet Data LAN rather than fiber channel as used by Tier 1. Some uses may be as disk for Windows and Unix applications, SQL databases, Windows file servers, and e-mail applications.
- Tier 3i provides a highly resilient platform through the use of 24x7 predictive self-monitoring with vendor phone-home, RAID, battery backup, redundant power supplies, hot-swappable power and cooling, ethernet trunking/link aggregation, network interface port failover, data mover failover and internal environmental monitoring.
- This tier is available to most Open Systems servers.

Unisys Mainframe Data Storage

- EMC storage is designed for high availability requirements specifically for the Unisys mainframe operating environments.
- EMC storage is available to Unisys 2200 and A-Series operating environments.

Mainframe-only Storage Management Services:

- Storage Management (IBM Mainframe systems): CIO/OFT technical staff will provide maintenance of storage classes and Storage Management Services (SMS) constructs as necessary to manage the allocation and storage of data in DASD and Tape media. The service includes management of storage volumes as appropriate and provide criteria and guidelines to the customer Agency Information Security Officer where applicable to manage security access permissions.



This service is available during Standard Business Hours.

ROLES AND RESPONSIBILITIES

CIO/OFT RESPONSIBILITIES

CIO/OFT Is Expected To Provide Services in Each of the Following Categories:

General Data Center Operations and Services -

- Ensure a robust physical environment, with proper environmental and security controls that operates efficiently by:
 - Resolving Level 1 and Level 2 production problems within 3 hours of reporting the incident 97% of the time.
- Effectiveness:
 - Ensure an annual customer satisfaction rating of at least 4.1 or more on a 5 point scale.
- Meet Service Level Performance Measurement Targets as defined in **Table 4** in the Service Level Agreement for IT Shared Services.

MAINFRAME OPERATIONS

- Ensure a reliable and secure mainframe environment by:
 - Ensuring mainframe is available at least 99.98% in a 24x7x365 environment, not including scheduled down time.
- Operate mainframe systems, monitoring the proper capacity and performance, and taking appropriate escalation actions
- Install and maintain mainframe operating systems, system utilities and Independent Software Vendor supplied software
- Optionally provide an IBM mainframe report viewing and distribution system for IBM Mainframe customers
- Optionally provide IBM mainframe disaster recovery service and annual disaster recovery testing. Provide an IBM mainframe report viewing and distribution system for IBM Mainframe customers, as requested
- Provide monthly mainframe usage reports and post on the SLA website

DISTRIBUTED SYSTEMS - SERVERS

- Provide reliable and cost-efficient server operation by:
 - Ensuring servers are available 99% of the time
 - Completing new physical server provisioning within 8 weeks or less, 97% of the time
 - Completing new virtual server provisioning within 10 business days or less, 100% of the time
- Perform installation, configuration, and maintenance of server operating systems for physical and virtual servers. Provide server backup and recovery, including media management

- Provide local and global load distribution services for servers
- Provide standard server monitoring for all production servers; custom monitoring requests will be evaluated and provided for as resources are available.
- Optionally provide assistance with Customer Agency software installation, and configuration
- Provide an application appliance hosting service
- Provide a reverse proxy server service
- Provide assistance with Customer Agency software installation and configuration as requested when resources are available
- Provide virtual turnkey server hosting on CIO/OFT-owned platforms deemed the standard by CIO/OFT
- Provide Application Monitoring services for Java 2 Enterprise Edition (J2EE) based applications as requested when resources are available
- Provide technical support for troubleshooting Sev-1 and Sev-2 issues, requesting a telephone bridge and participation of other groups as needed to ensure that any problems with server infrastructure or data center network causing the outage are corrected

STORAGE

- Provide reliable and cost-efficient Storage Services by:
 - Ensuring data storage is available 99% of the time
- Provide multiple data storage options and the supporting services including: design, storage area network, provisioning, monitoring, and capacity planning
-

PRINT

- Provide reliable and cost-efficient Print Services by:
 - Printing rework is performed 1% of the time or less 99.96% of the time.
- Ensure print jobs are correctly printed and packaged for delivery following state policy which limits and guides the printing of Social Security Numbers

Note: *Should CIO/OFT need to print documents with Social Security Numbers, in compliance with the policies above, CIO/OFT is not liable for mistakes caused by customer programming which does not easily enable staff to identify print errors. Multiple page documents that contain sensitive information should include page numbers as a way to identify that they are printed correctly.*
- Place discarded print in Confidential Destruction bins

CUSTOMER AGENCY RESPONSIBILITIES

Customer Agency Is Expected To:

General Responsibilities -

- Transport tapes, other than those transported via Iron Mountain services
- Manage remote networking beyond an agreed upon demarcation point
- Define and manage non-operating system backups and recovery activities
- Provide application and database support including development, performance tuning and software migration support
- Participate in the CIO/OFT Change Board (Please see FAQ's for further information)
- Notify CIO/OFT of major consumption changes

Mainframe Operations Responsibilities -

- When applicable, define reports for the IBM report viewing system
- When applicable, review and respond to CIO/OFT change control requests in a timely manner
- Provide a DR plan for IBM Mainframe Disaster Recovery and Customer Agency coordinator; provide recovery documentation and data validation
- Manage access security within Customer Agency mainframe partition
- Provide initial procedures documentation, that will then be maintained by CIO/OFT
- Provide recovery documentation and data validation
- Supply Run Books, including error handling procedures or any other requested relevant documents to ensure smooth operations and communications

Server (s) Operations Responsibilities -

- Purchase server monitoring software licenses as well as licenses for all other software components
- Maintain current hardware and software support
- Perform server database administration, data integrity, testing and support of application code
- Provide technical support for troubleshooting Sev-1 and Sev-2 issues and participate in telephone bridge as needed to ensure that any problems with application software causing the outage is corrected
- Provide application and testing support to ensure that applications are functioning properly after maintenance and/or Sev-1 and Sev-2 issues are resolved

Production Control Responsibilities -

- Supply run documentation, scheduling requirements, monitoring requirements and error handling procedures

Print Responsibilities -

- Limit printing of social security numbers as outlined in the following policy www.cio.ny.gov/Policy/P09-004/SSN_Initiative_Remediation_Policy_FINAL_10_15_2009.pdf
- Make arrangements for the printed output to be transported from the print room to its destination
- Assume responsibility for the printed output once it is removed from the print room by either the customer agency or their designated courier service

RATES

The CIO/OFT rate process is initiated in the summer of each year to deliver draft rates to the NYS Division of Budget (DOB) in the fall. This enables all of the agencies to develop their budgets using projected CIO/OFT rates. Rates are then finalized by the beginning of the fiscal year, submitted to DOB for final approval then communicated to the customer base through Customer Relations, reflected on new project support proposals, and used for billing for that fiscal year.

Data Center rate development has evolved over the years to include more granularities within each rate in an effort to achieve multiple goals including:

- Reduction of the data center overhead account
- Increased accuracy of the costs associated with a particular service area
- Reduction of costs and ultimately rates
- Increased ability to effectively manage the service areas over the course of the year

HOW RATES ARE CALCULATED

Each service area has a metric identified which describes how usage will be measured and billed. This metric is then used to estimate the annual usage for the next fiscal year, taking into consideration anticipated increases or reductions in usage. This estimated usage has sometimes included input from customer surveys issued by Customer Relations, but historically the reported projections from customers have been inaccurate. We have found that by watching trends in usage we can more accurately project usage. However, at any point in a fiscal year a customer can significantly increase or decrease usage without notifying CIO/OFT in advance. That is the challenge in managing rates.

RESOURCES

Data Center Services

http://www.cio.ny.gov/data_center

Mainframe Services

http://www.cio.ny.gov/data_center

Mainframe Services Detail Sheet

<http://www.cio.ny.gov/assets/documents/servicefactsheets/inSERVICE-MainframeHosting.pdf>

Distributed Systems Services

http://www.cio.ny.gov/data_center

Data Storage Detail Sheet

<http://www.cio.ny.gov/assets/documents/servicefactsheets/inSERVICE-DataStorage.pdf>

CONTACT US

Customer Relations Managers listed by State Agency

<http://www.cio.ny.gov/support/ContStateCRMs.htm>

Contact CIO/OFT Customer Relations Managers or the Customer Care Center at

1-866-789-4638 or 518-402-2537

When You Call

Option 1: Technical Support

Additional Choices:

1. Customer Care Center
2. Data Center Operations
3. NYeNet Network Operations Center (NOC)
4. Voice Services

Option 2: State and Local Government Customer Service (for Customer Relations Managers)

Option 3: New York State Directory Assistance Operator

OR by E-Mail at: customer.relations@cio.ny.gov