



## **Service Level Agreement**

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# **Mainframe Hosting**

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## Service Description

The N.C. DIT provides managed mainframe hosting solutions for mission-critical z/OS applications for state and local governments, municipalities, and school systems. Our zSeries server offers the ultimate protection for your data while simplifying compliance to regulations. They also allow you to apply machine learning to your most valuable data to create deeper insights. The DIT zServer single-frame model can process monthly daily average of 27 million encrypted transactions.

- **Encrypt application data at rest and in flight**  
Simplify compliance and protect your critical data from internal and external threats at low cost, with high performance, and without application changes. Pervasive encryption on the DIT zServer offers a data-centric approach to information security. It encrypts data in flight, in use, and at rest to help meet complex compliance mandates while reducing the risks and financial losses of a data breach.
- **Deliver exceptional service – even during peak volumes**  
Our zServer delivers more performance so you can deliver quality service – even at peak transaction rates. This server rapidly responds to changes in business demands by reallocating resources automatically based on priorities and by quickly and efficiently deploying new services.
- **Gain business continuity with a reliable platform**  
Ensure continuity of operations with availability built into every element of the system. DIT zServer delivers 99.99 percent application availability and powerful disaster recovery capabilities.
- **Create value through secure application and data innovation**  
Discover and expose existing code for rapid and efficient new service creation. Optimize resource utilization and simplify management to drive efficiency. Enable flexible deployment of micro-services, increase services reuse, and deliver efficiency through new economic models.

Our Mainframe Hosting Services Teams are responsible for making software, hardware, and operating system environments available that enable fast and reliable processing. Virtual storage in disk and tape provides a complete system for a customer to execute batch or real-time job streams.

## Mainframe Services

### ➤ z/OS System

- Maintain software currency – n-1 (level of maintenance current – 1)
- review software costs and software duplications
- Review Agency requirements
- forecast and plan z/OS requirements like encryption, system configuration changes and new features

### ➤ Security

Added MFA segment to the RACF userid profile and indicate which sign on method will be used. MFA is configured for use by TSO/ ISPF, DB2, IMS, CICS

- Manage system security support
- Encryption
  - Ciphers are strong and current
  - Maintain state encryption standards
  - Support customer to maintain encryption requirements
  - Yearly certificate renewals

### ➤ Monitoring and automation

- Monitoring can send alerts by email/ text
- Monitor of infrastructure internal and external network connections
- Monitor of daily system batch & online processes
- Automation
  - Support OPS/MVS Automation and Zeke Scheduler
  - Automated batch job restart and recovery by ASG-Zebb
  - Automated system alert notification via AutomationPoint and SOI
  - Schedule batch jobs in Zeke
  - CA SYSVIEW® Performance Management

### ➤ Mainframe Network

The scope of Mainframe Network is to support the system software on the mainframe that support the agencies data transfers, follow state encryption policies by managing encrypted configurations, and customer support.

Mainframe Network team provides technical support for the following:

- File transfer: sftp, FTPS, Connect:Direct
- CSSMTP (mainframe email)
- Maintaining the latest supported encryption levels

The activities of the Mainframe Network team are:

- Monitoring
  - External system-to-system connections. (i.e., EE and NJE)
  - DIT network connections to the mainframe and control units
- Analysis
  - Review the network infrastructure to ensure proper design for disaster recovery and customer needs
  - Ensure encryption requirements are being met
  - Proactive with z/OS upgrade/migration requirements
  - Manage hardware configurations: HMC, control units, thin client consoles
- SLAs
  - Ensure supported software is maintaining n-1 levels
  - Resolve customer incident and service request tickets in a timely manner

➤ **Hardware support**

- IOGen
- Control units
- HMC
- Thin client consoles

➤ **Printers**

- Local and Remote printer support for VTAM attached printers, LRS-VPS, DRS

➤ **Transaction Services (CICS, IMS & MQSeries)**

The Transaction Services team within Mainframe Hosting Services section has the overall responsibility for access to the z/OS On-line applications written and supported by various State of NC agencies. The Transaction Services team purpose is to ensure that the z/OS online environment is available for all NC state agencies utilizing the various applications running on the z/OS platform.

The scope of the Transaction Services group is as follows:

- z/OS On-line Access.
- DIT offers traditional (CICS and IMS) online processing time, available by the minute, and online Web and Middleware Services

running under z/OS. CICS and IMS, defined below, are the predominant online transaction managers used by DIT for z/OS. Customer Information Control System (CICS) is a general-purpose mainframe-based data communication system that supports a network of thousands of terminals. CICS provides an environment for the execution of online application programs, including interfaces to files and database products, such as VSAM, DB2, and IMS. CICS can also be accessed by MQSeries via MQClient and/or MQServers and CICS Transaction Gateway (CTG).

- Information Management System (IMS) is a database/data communication system that allows DIT customers to access IMS-defined databases and DB2 databases through attached communication terminals. IMS controls the terminals and allows the customer to communicate with IMS databases utilizing high level programming languages. IMS can also be accessed by MQSeries via MQClient or MQServers.
- Provides 24 x 7 support for Transaction Services systems.
- CICS, IMS, Middleware MQ/FTE (MQSeries File Transfer Edition), MQSeries, Host On Demand (Web based 3270 emulation), CA products/Utilities, Multiple OEM products and others.
- 117 CICS Customer Regions
- 75 + IMS Control & Dependent Regions
- WMQ & MQ/FTE subsystems (MQ has 18 subsystems being supported, 9 of which are MFT (Managed File Transfer))
- Duties – Customer Configuration, Troubleshooting & Support, System Installation & Maintenance.

## ➤ **DB2**

The DB2 Database Services team, within Mainframe Hosting Services, provides database hosting solutions for DB2 environments on the mainframe (z/OS platform). The DB2 team offers systems database support services to meet customer requirements. The scope of the team's support services is as follows.

- DB2 database Installation – build and install DB2 environments at current database software levels as well as associated DB2 related vendor tools, i.e.: CA/Broadcom, IBM, etc.
- DB2 database Migration – perform DB2 version migrations to maintain software currency.
- DB2 database Monitoring – perform day to day monitoring of DB2 subsystem performance and control.
- DB2 database Maintenance – apply DB2 software maintenance as needed to maintain subsystem.
- DB2 database Performance and Tuning – optimize DB2 workloads and resources to improve the subsystems overall performance.

➤ **Disaster Recovery**

We utilize Hitachi Universal Replicator (HUR) to perform data mirroring to our Disaster Recovery Centre.

- We mirror mainframe data 24/7 in an asynchronous manner with data current to within 5 minutes or less.
- Data Mirroring allows us to shorten recovery time and minimize both Mainframe Recovery Time Objective (RTO) and Recovery Point Objective (RPO).
- The data is secure in its transmission (encrypted in flight) between datacenters.

## **Software and Performance**

The Capacity and Performance Management (CAPM) team within Hosting Services Software and Performance Management section, has the overall responsibility for Capacity Management process which provides a point of focus and management for all capacity and performance related issues. Capacity Management purpose is to ensure that capacity is in place and is performing sufficiently to meet current and future needs of DIT customers and IT infrastructure.

The scope of CAPM's Capacity Management process is management and manipulation of data, Capacity Planning, Performance Management, Availability Management, Storage Capacity, Revenue Analysis, and Reporting

Capacity Management processes can be divided into two services:

- Workload Capacity Management – monitors and controls the performance of the customer's IT services through examining relevant data.
- Resource Capacity Management – monitors the performance of components within the IT infrastructure.

The activities of Workload Capacity Management and Resource Capacity Management are:

- Demand management – Transfer resource demand to prevent customer and infrastructure components from becoming overloaded.
- Monitoring – Measure and assure that customer and infrastructure components are achieving an acceptable service. Examples of resources that are monitored are CPU utilization, DASD utilization, response times, and storage utilization.

- Analysis – A study of workload and resource capacity components used to forecast future needs. This component analysis may initiate efficiency improvements and/or the acquisition of additional IT resources.
- Tuning – Optimize system workloads and resources to improve the customers performance and costs.
- Data modeling and reporting – Provide and secure data models used for the development of BI reports and visualizations.

## **Mainframe Software Support**

### **Storage Management**

Link to Storage management <https://it.nc.gov/services/hosting/distributed-hosting>

### **Middleware**

Link to Middleware services <https://it.nc.gov/services/hosting/middleware>

## **Service Commitments**

**Mainframe Availability:** The target availability for each production LPAR on the mainframe is 99.99%.

**Disaster Recovery:** The target Recovery Time Objective (RTO) for the mainframe complex is 6 hours. This is the time when DIT would be able to turn over the mainframe environment to individual agencies to begin restoring their production application environments.

### **Hours of Availability**

This service is available to customers 24 x 7 and adheres to the maintenance window schedule listed in the DIT Global Services document.

## DIT Responsibilities

### Support and Maintenance

Standard operational support hours are from 8:00 a.m. to 5:00 p.m. Monday - Friday EST. On-call, outside normal business hours, weekend, and holiday support is provided for production systems only. After-hours support is provided for test systems as needed and scheduled by customers with at least a two-week lead time. This allows the Mainframe Hosting team to coordinate system support events (that are required for day-to-day operations) around customer needs.

The Mainframe Support team, within Mainframe Hosting Services, has the overall responsibility for installing, customizing, and maintaining the base operating system software and vendor software in the mainframe environment used by the State of NC agencies in their daily work.

The scope of the Mainframe Support team is as follows:

- Support the installation, upgrade, customization, and maintenance for all mainframe LPARs. These LPARs might be running z/OS, z/VM operating systems. DIT keeps these LPARS at n or n-1 level of support from the vendors.
- Support the installation, upgrade, customization, and maintenance of OEM (Other Equipment Manufacturer) software such as Broadcom, Syncsort, SAS, IBM, and Systemware.
- Maintain and run twice-a-year Disaster Recovery tests of the mainframe environment allowing the agencies to test and verify their applications at the recovery site.
- Monitor capacity and performance of the mainframe and major components.
- Monitor and implement security (RACF) procedures to meet state and federal auditing guidelines.
- Develop automation to monitor and alert on system events and provide notification to agencies of job abends.
- Provide 24x7 on call support to the agencies for problem resolution.

The Mainframe Support team offers several application development languages the agencies can use to create and execute their applications. This includes traditional mainframe languages such as COBOL, REXX/CLIST, PL/I, Easytrieve, APL2, DCF, SAS along with newer languages such as C/C++, JAVA, node.js, and Unix System Services.



**Disaster Recovery**

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**Customer Responsibilities**

Customer can contact NC DIT Service Desk at 919-754-6000 or create a ticket in the NCDIT Service Portal for any Mainframe hosting related service.

**Service Level Agreement Scope**

This agreement specifies only the standard operational service commitments and responsibilities of DIT and DIT customers. Customer-specific deviations from these commitments and responsibilities will be specified in an accompanying Memorandum of Understanding. Service rates are outside the scope of this agreement and are specified in financial documents.



## Signatures of Approval and Agreement Date

### Customer Signatures

**Agency Head or Designee:**

Name	Title	Signature	Date

**Agency Chief Financial Officer:**

Name	Title	Signature	Date

### DIT Signature

**State Chief Information Officer:**

Name	Title	Signature	Date