

# **ERP Infrastructure Guide**

## **APPENDIX B**

*for*

State of Georgia



**State Road and Tollway Authority**

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# 1 INTRODUCTION

## ***1.1 Purpose***

The Enterprise Resource Planning (ERP) Infrastructure Guide is intended to be a reference to define technical requirements, guidelines, and details which are unique to the design of the ERP components to support State Road and Tollway Authority (SRTA). When new or updated systems are required for SRTA an Infrastructure Guide is established to document the current, proposed, and installed environments. This guide will also include an Interface Control Document (ICD), which will define the data migration from the current ERP system, Microsoft Dynamics Great Plains v10 (MSDGP), to the proposed, Microsoft Dynamics AX (MSDAX), and will document any integration between the ERP system and any third party application. The ICD details will be added into this document after design.

## ***1.2 Intended Audience***

This document has been prepared for the SRTA ERP System Integrator (SI) and the SRTA Information Technology (SRTA IT) Department to provide specific information related to the current MSGP infrastructure when designing SRTA's new ERP solution using MSDAX. It will be the sole source of technical information provided to potential bidders of the SRTA ERP Request for Proposal (RFP). It will also define the responsibility demarcation between SRTA IT and the ERP SI.

### **1.2.1 Host Environment (SRTA IT)**

Design and provision of the following SRTA infrastructure components are considered to be primarily the responsibility of SRTA IT. The following Local Area Network (LAN) infrastructure areas are covered in this document:

- ESX Clustered VM Environment – Hosts, VMs, DBs, Virus Protection;
- LAN/Wide Area Network (WAN);
- Data Center Environment – Power, UPS, HVAC, Racks, KVM;
- Storage Area Network (SAN);
- Desktop/Laptop;
- Data Backup;
- Directory Service;
- Security.

### **1.2.2 ERP Application Components (ERP SI)**

Design and provision of the following ERP Application components are considered to be primarily the responsibility of the ERP SI. Some of these requirements will require SRTA IT for installation and configuration. The design and specification of these areas is addressed in this document:

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- VM Requirements – memory, processors;
- Microsoft OS Requirements;
- Data store Requirements;
- Microsoft SQL Server and Database requirements;
- Microsoft Dynamics AX (MDAX);
- Client Access Requirements;
- Web Interface;
- Special Requirements for any proposed MSDAX modules;
- Hosted/Cloud Environment

### 1.2.3 Data Migration (ERP SI)

Planning and design of the ERP Data Migration and Cut Over is considered to be primarily the responsibility of the ERP SI.

## 1.3 Abbreviations

The following are common abbreviations which may be used in this document, if required.

**BC/DR** – Business Continuity and Disaster Recovery  
**CAL** – Client Access License  
**ERP** – Enterprise Resource Planning  
**LAN** – Local Area Network  
**MSDAX** – Microsoft Dynamics AX 2012 Public Sector  
**MSDGP** – Microsoft Dynamics Great Plains v10  
**MSEA** – Microsoft Enterprise Agreement  
**OS** – Operating System  
**SRTA** – State Road and Tollway Authority  
**SI** – Offeror/System Integrator  
**VM** – Virtual Machine  
**VNIC** – Virtual Network Interface Card  
**ETL** – Extract Transform Load

## 2 CURRENT ENVIRONMENT

### 2.1 SRTA Infrastructure

The SRTA Infrastructure is a scalable dynamic hosting environment that combines industry standard hardware (physical) with best practice software (logical). This section is a summary of the SRTA Infrastructure and its subcomponents.

#### 2.1.1 Host Environment

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SRTA manages a VMWare ESX 4 host environment. There are three Dell PowerEdge R610's in a clustered configuration. VMWare clusters are primarily for fault tolerance. DRS and HA are both enabled to allow for seamless failover in the event one of the hosts has a hardware problem. There are a total of 36 processors with 95 GHz of CPU resources and 287.96 GB of RAM in the cluster. There are currently 22 Virtual Machines running in this cluster.

### 2.1.1.1 Virtual Server/Operating System

GATOLL-SQLAPP is the current MSDGP VM. Below is a brief summary of the OS configuration parameters of this VM:

```
Microsoft(R) Windows(R) Server 2003, Enterprise Edition
Version 5.2.3790 Service Pack 2 Build 3790
Other OS Description Not Available
OS Manufacturer Microsoft Corporation
System Name GATOLL-SQLAPP
System Manufacturer VMware, Inc.
System Model VMware Virtual Platform
System Type X86-based PC
Processor x86 Family 6 Model 15 Stepping 1 GenuineIntel ~2660 Mhz
Processor x86 Family 6 Model 15 Stepping 1 GenuineIntel ~2660 Mhz
BIOS Version/Date Phoenix Technologies LTD 6.00, 9/22/2009
SMBIOS Version 2.4
Windows Directory C:\WINDOWS
System Directory C:\WINDOWS\system32
Boot Device \Device\HarddiskVolume1
Locale United States
Hardware Abstraction Layer Version = "5.2.3790.3959 (srv03_sp2_rtm.070216-1710)"
Time Zone Eastern Daylight Time
Total Physical Memory 3,095.21 MB
Available Physical Memory 558.38 MB
Total Virtual Memory 6.28 GB
Available Virtual Memory 3.97 GB
Page File Space 3.42 GB
Page File C:\pagefile.sys
1 VNIC – 172.20.20.86 – 1 Gbps
```

The figure below summarizes the drive space. E: is the data volume.

Name	Type	Total Size	Free Space
<b>Hard Disk Drives</b>			
Local Disk (C:)	Local Disk	35.0 GB	10.3 GB
SQLAPP1 (E:)	Local Disk	224 GB	97.6 GB

### 2.1.1.2 Database

The Microsoft SQL Database that serves MSDGP is version 2005 - 9.0.1406. Details of the DB location on the VM are in the figure below.

Logical Name	File Type	Filegroup	Initial Size (MB)	Autogrowth	Path	File Name
GPSCONSDat.mdf	Data	PRIMARY	536	By 20 percent, unrestricted growth	E:\Microsoft SQL Server\MSSQL1\MSSQL\DATA	GPSSRTADat.mdf
GPSCONSLog.ldf	Log	Not Applicable	120	By 25 percent, restricted growth to 2097152 MB	E:\Microsoft SQL Server\MSSQL1\MSSQL\DATA	GPSSRTALog.ldf

The individual DB files and sizes are listed in the figure below. The primary GP DB is highlighted.

Name	Size	Type	Date Modified	Attributes
GPSPR400Dat.mdf	2,150,912 KB	SQL Server Databa...	6/17/2013 9:05 AM	A
GPST400Dat.mdf	1,493,632 KB	SQL Server Databa...	6/17/2013 9:05 AM	A
GP5GA400Dat.mdf	1,142,784 KB	SQL Server Databa...	6/17/2013 9:05 AM	A
<b>GPSSRTADat.mdf</b>	548,608 KB	SQL Server Databa...	6/17/2013 9:05 AM	A
GP5GENERDat.mdf	548,608 KB	SQL Server Databa...	6/17/2013 9:05 AM	A
GP5SPREVDat.mdf	491,520 KB	SQL Server Database Primary Data File	6/17/2013 9:05 AM	A
GP5TGENDat.mdf	457,152 KB	SQL Server Databa...	6/17/2013 9:05 AM	A
GP5CONSDat.mdf	457,152 KB	SQL Server Databa...	6/17/2013 9:05 AM	A
GP5GAUTHDat.mdf	380,928 KB	SQL Server Databa...	6/17/2013 9:05 AM	A
GP5PFHOVDat.mdf	264,512 KB	SQL Server Databa...	6/17/2013 9:05 AM	A
msdbdata.mdf	231,424 KB	SQL Server Databa...	6/17/2013 9:05 AM	A
GP5PFSTIDat.mdf	220,416 KB	SQL Server Databa...	6/17/2013 9:05 AM	A
GP5PFPPIDat.mdf	220,416 KB	SQL Server Databa...	6/17/2013 9:05 AM	A
GP5DEBTDat.mdf	220,416 KB	SQL Server Databa...	6/17/2013 9:05 AM	A
GP5CAPPRDat.mdf	196,928 KB	SQL Server Databa...	6/17/2013 9:05 AM	A
GP5SRTALog.ldf	122,368 KB	SQL Server Databa...	6/17/2013 9:05 AM	A
GP5CONSLog.ldf	122,368 KB	SQL Server Databa...	6/17/2013 9:05 AM	A
GP5DYNAMICSDat.mdf	73,728 KB	SQL Server Databa...	6/17/2013 9:05 AM	A
modellog.ldf	39,296 KB	SQL Server Databa...	6/20/2013 2:00 AM	A
mssqlsystemresource.mdf	38,976 KB	SQL Server Databa...	10/14/2005 2:56 AM	A
tempdb.mdf	34,688 KB	SQL Server Databa...	6/19/2013 4:53 PM	A
GP5SPREVLog.ldf	20,480 KB	SQL Server Databa...	6/17/2013 9:05 AM	A
msdblog.ldf	16,128 KB	SQL Server Databa...	6/17/2013 9:05 AM	A
SonaticaTrunk201106170924...	13,632 KB	SQL Server Databa...	6/17/2013 9:05 AM	A
templog.ldf	10,176 KB	SQL Server Databa...	6/20/2013 8:15 AM	A
SonaticaTrunk201106170924....	7,168 KB	SQL Server Databa...	6/17/2013 9:05 AM	A
distmdl.mdf	5,120 KB	SQL Server Databa...	10/14/2005 3:05 AM	AC
master.mdf	4,096 KB	SQL Server Databa...	6/17/2013 9:05 AM	A
ReportServer.mdf	3,264 KB	SQL Server Databa...	6/17/2013 9:05 AM	A
distmdl.ldf	2,816 KB	SQL Server Databa...	10/14/2005 3:05 AM	AC
ReportServerTempDB.mdf	2,240 KB	SQL Server Databa...	6/17/2013 9:05 AM	A
model.mdf	2,048 KB	SQL Server Databa...	6/17/2013 9:05 AM	A
ReportServerTempDB_log.LDF	768 KB	SQL Server Databa...	6/17/2013 9:05 AM	A
ReportServer_log.LDF	768 KB	SQL Server Databa...	6/17/2013 9:05 AM	A
mastlog.ldf	768 KB	SQL Server Databa...	6/17/2013 9:05 AM	A
mssqlsystemresource.ldf	512 KB	SQL Server Databa...	10/14/2005 2:56 AM	A

### 2.1.1.3 Virus Protection

GATOLL-SQLAPP has virus protection managed and configured by the Symantec Endpoint Protection Small Business Edition. The database files and MSDGP application files are excluded from daily scans and real time protection.

### **2.1.2 LAN/WAN**

The LAN has two components, the Cisco physical switched and the virtual network. The Cisco switched network consists of two chassis – a 4507 and 6509. The 4507 is a Distribution switch that the ESX hosts connect to. It is mostly VLAN 20. The 6509 is the Core and contains the RSMs and Access Layer blades that the users connected to. They are both managed by AT&T under a SRTA managed contract. The VMWare virtual network is configured within VSphere. It coincides with the VLAN on the 4507. GATOLL-SQLAPP is on the production virtual network. The current IP address of the GATOLL-SQLAPP server is 172.20.20.86/24 – GW – 172.20.20.1.

SRTA does allow remote access to MSDGP via our client to site VPN. The WAN connection at SRTA is an AT&T managed 6 Mbps DS3. An ASA firewall sits behind the WAN connection for VPN and Security.

### **2.1.3 Data Center Environment**

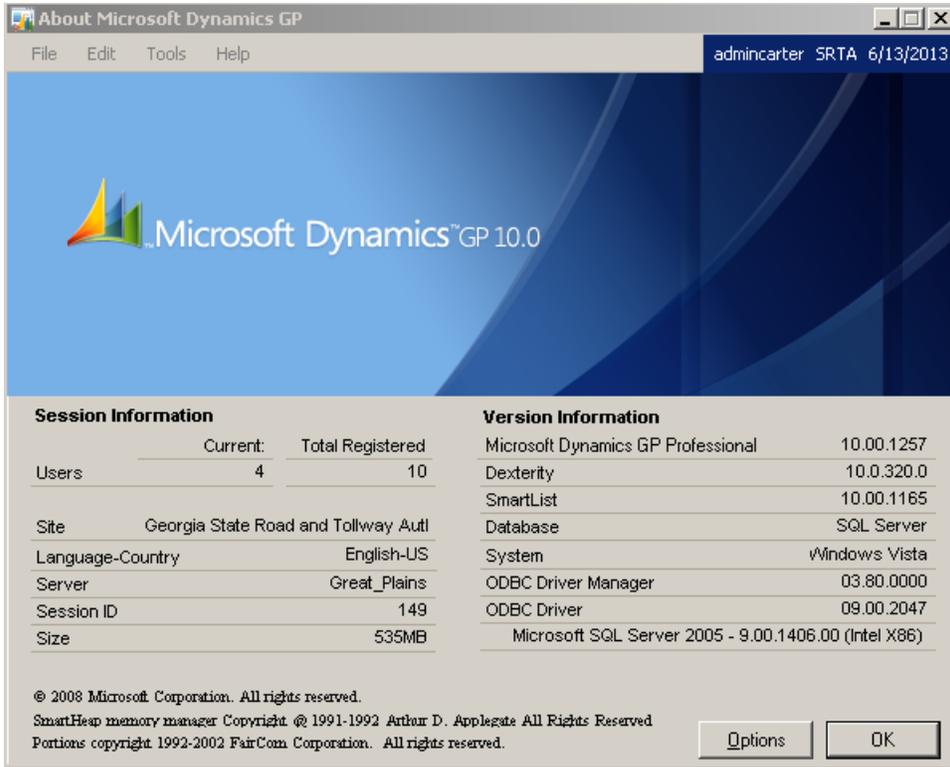
SRTA manages a Tier 1 data center. It has a single HVAC, which is managed by the Georgia Building Authority. There is no backup generator to the facility, so SRTA manages UPSs to facilitate graceful Host shutdowns in the event of power loss. The UPSs are on a maintenance contract with EEC. The hosts are all contained in Racks which are properly spaced throughout the room.

### **2.1.4 Storage Area Network**

SRTA recently purchased a Dell Compellent Storage Area Network (SAN). In tier 1 there are 24 x 300 GB 15K SAS drives and in tier 2 there are 36 x 3 TB 7.5K SAS drives. More information on capacity and RAID types is available upon request. The SAN is presented to the VMWare environment through LUNs. The LUNs are then broken into VM Datastores. The GATOLL-SQLAPP VM uses Production ESX Volume 10. This data store has 1023 GB of space, with 876 GB provisioned and 317 GB free. The SAN is managed by Dell through a maintenance contract.

### **2.1.5 Desktop/Laptop**

SRTA managed MSDGP users have Dell 6320s laptops with ample processing power, memory and hard drive space. The hardware is managed by Dell through a maintenance agreement. The OS and applications are managed by SRTA. Standard Operating System is Windows 7 SP1 x64 with Office 2010 Professional Plus (32-bit). The MSDGP client is v10.00.1257. A screen shot of the client information is below.



### 2.1.6 Data Backup

A full backup of the SQL DBs on GATOLL-SQLAPP is run every night using Commvault, first to Disk then to Tape. Data is kept on the tape for a week then wiped. The Windows File System is backed up on a weekly basis. Database backups are also performed nightly at 2:00 AM via Redgate SQL Backup. Hourly differential backups are performed locally on the SRTA database between 8 AM and 8 PM daily.

### 2.1.7 Directory Service

SRTA manages a Microsoft 2008 Active Directory (AD). The Forest is in GATOLL-SQLAPP is a member server of the SRTA Domain in this Directory – functional level 2003. The MSDGP Database has local and AD permissions integrated. The MSDGP client has been deployed with an AD Group Policy. DNS is AD integrated. GATOLL-SQLAPP uses 172.20.20.12 as its primary DNS.

### 2.1.8 Security

MSDGP security is managed by the application and database. There are individual user ids in the MSDGP that have permission profiles.

## 2.2 Microsoft Enterprise Agreement

The Georgia Master Agreement number is 01E61322 and the SRTA enrollment number is U1973784.

## **2.2.1 Microsoft Software Licensing**

### **2.2.1.1 Operating System**

Single Microsoft Windows 2003 Enterprise Edition license purchased through MSEA

### **2.2.1.2 SQL Server**

Single Microsoft SQL Server License – purchased through MSEA

### **2.2.1.3 Great Plains**

Single Microsoft Dynamics Great Plains Server License – purchased through certified business partner.

Seat licenses:

- Nine Additional Professional Users
- One Foundation Layer Professional
- Eight Management Reporter Designer User
- Fifty Management Reporter Viewer User

### **2.2.1.4 Client Access Licensing**

SRTA maintains its own CALs for Microsoft Office, SQL, and Windows Operating Systems (Core). SRTA currently has 65 MSEA CALs for all desktops.

## **2.2.2 Microsoft Support Agreement**

SRTA has a Microsoft maintenance agreement called the Dynamics GP Business Ready Advantage Plus Plan. The Plan Account Number is 5190583 and expires in 7/17/2014.

# **3 PROPOSED ENVIRONMENT**

## **3.1 MSDAX Server Prerequisites**

### **3.1.1 Virtual Machine**

The SI shall specify the Virtual Machine configuration parameters needed to host the MSDAX software. The number of processors, amount of dedicated RAM, and hard drive space will all need to be provided to SRTA IT for allocation in the Host Environment.

### **3.1.2 Operating System**

The SI shall provide SRTA IT with the Windows 2008 version required for the application VM. Any OS parameters will also need to be documented.

### **3.1.3 Database Software**

The SI shall provide SRTA IT with the Microsoft SQL Database software version required to run with MSDAX. AX system requirements state that it must be SQL 2008 or higher. The SI will also need to dictate whether the database and the application should run on the same VM.

### **3.1.4 Data store**

The VM will have a data store pre-assigned through the set up process. If there is a unique disk configuration needed for the VM, it may also need to be taken into consideration from the SAN LUN/VM Data store.

### **3.1.5 Virus Protection Exclusions**

After installation of the MSDAX and SQL Database software on the designated server(s) it may be recommended to excluded program files, databases, and logs from the Symantec Antivirus active and scheduled malware/virus scans. The SI shall provide SRTA IT with the directories and files that need to be excluded from the antivirus protection.

## ***3.2 Microsoft Dynamics AX 2012***

The SI will be responsible for design, planning, and implementation of the MSDAX software. SRTA would like to explore redundancy solutions for this software for BC/DR. This will be addressed during the Design phase. Prerequisite hardware, software, and licensing specifications (same as above) shall be provided by the SI.

## ***3.3 Client Access***

The SI will be responsible for planning, configuration, and deployment of the new MSDAX client software. If there is a web interface then the minimum browser requirements shall be provided by the SI.

## ***3.4 Web Interface***

The MSDAX software has a Web Interface and portal components. This interface will have software requirements. If the web interface/portal is a recommended access method, then the SI shall provide all the software requirements and configuration parameters for all the needed applications.

## ***3.5 Special Requirements***

The MSDAX software has numerous add on modules. These modules may have software requirements. The SI shall provide all the software requirements and configuration parameters for all the needed applications for any proposed MSDAX modules.

### ***3.6 Hosted/Cloud Environment***

The SI has the option to propose a Hosted or Cloud solution. This solution will need to be specified with a detailed description of the environment. Location, data center tier, redundancy, host types, etc. should be included in the proposal as a cut sheet/design guide.

## **4 DATA MIGRATION**

The Data Migration is a critical part of the proposed solution. A detailed data migration plan shall be provided to SRTA after the design phase is complete. A detailed ERD of the source and destination database and the ETL that will be used is preferred. SRTA maintains Interface Control Documents to catalog the interface between databases and third parties as well as data migrations. A sample ICD form will be supplied to act as a format for collecting the information. The data from the form will then be added to this document for reference.