

Stark County GIS System Maintenance Plan

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Purpose

The Stark County GIS Department began to design and build a countywide GIS system in 2008. Since then, the system has matured and been updated with new infrastructure. The GIS system had grown so much that it became difficult to maintain while achieving the goals of the GIS department and meeting the needs of its constituents. Maintenance procedures were developed to ensure the health and longevity of the infrastructure that runs the county GIS system.

This document will cover a brief overview of the Stark County GIS system. It will explain the components of the maintenance plan and describe the tools involved in the maintenance process. This document was started in December of 2017 and will continue to be updated as the Stark County GIS Department performs maintenance on its GIS system.

Overview of GIS System

GIS System

The Stark County GIS system is comprised of GIS databases, stand alone ArcGIS Servers, implementations of ArcGIS Enterprise, GeoEvent Server, supplemental servers, ArcGIS Desktop, and ArcGIS Online. All of these components are utilized to provide GIS services throughout the county. See Appendix 1 for a diagram of the Stark County GIS System.

Third Party Systems

There are several third party systems that interact with the GIS system. The GIS system pulls data from some of these systems, while other systems receive data from the GIS system. These systems are taken into consideration whenever maintenance is performed on the GIS system. Below is a brief description of these third party systems.

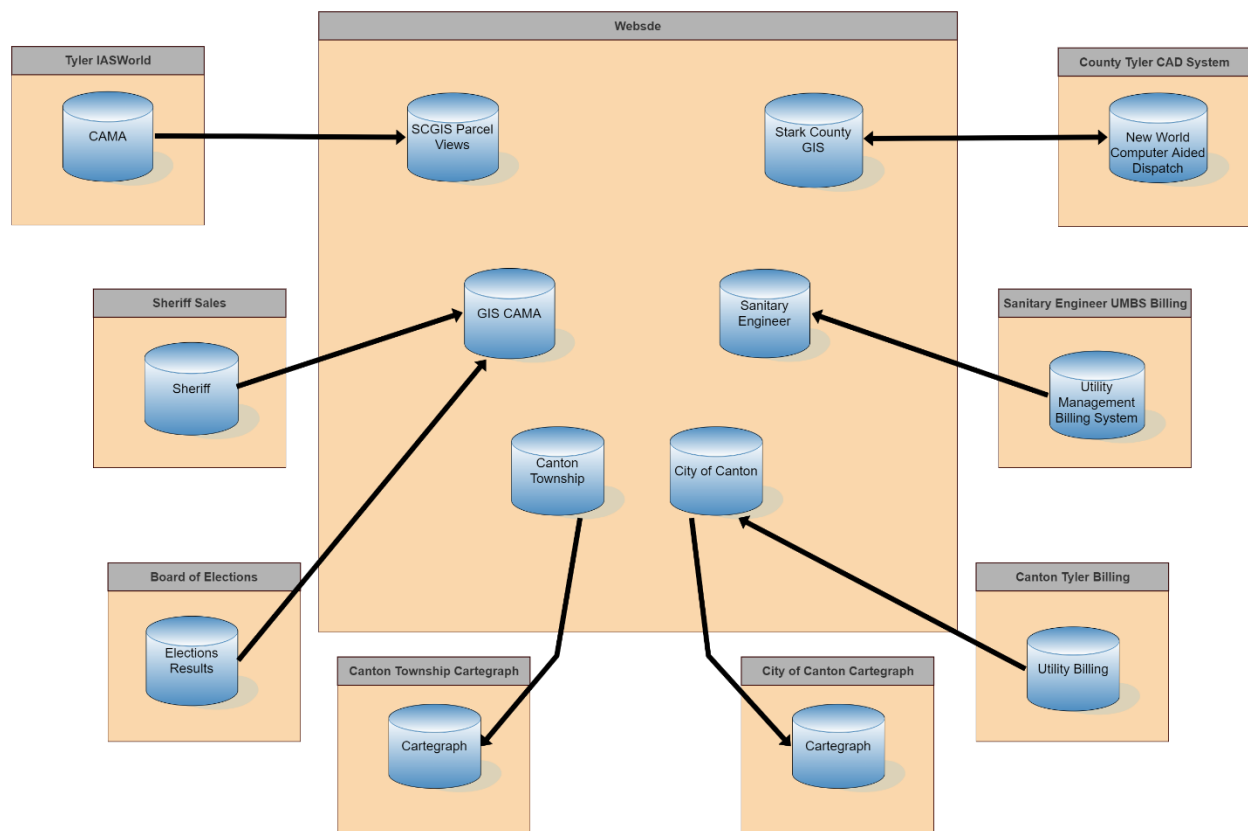


Figure 1

IASWorld CAMA

The IASWorld CAMA system stores parcel information maintained by the county Auditor and Treasurer. The GIS system pulls in some of the parcel data to be combined with the parcel boundaries via ETL procedures in SQL. This data is then published and consumed by composite applications, such as our parcel viewers, in order to provide more information about the parcels.

Sherriff Sales

The Sherriff Sales system stores data on sales involved in the Stark County Sherriff sales program. The GIS System pulls in the sheriff sales data so they can be combined with the parcel locations.

BOE Election Results

Election results are pushed to the GIS system after being reported to the Live Election Result application. The boundaries of each precinct and the current reporting status are included as well.

Canton Cartegraph

The City of Canton uses Cartegraph as their asset management software. As a geocentric system, Cartegraph leverages GIS data through ArcGIS Enterprise to provide direct integration between the two platforms.

Canton Township Cartegraph

Canton Township also uses Cartegraph as their asset management software, although with less integrations than the City of Canton.

Canton Utility Billing

The City of Canton's Water, Engineering, and Collections departments use Tyler Technologies' billing system for all of their utility billing and collection. The GIS system utilizes an export of the billing system in order to map the customers with the utilities they use. This data is also integrated with the City's Cartegraph implementation, as well as other composite applications.

Sanitary Engineer Billing

The Stark County Sanitary Engineer uses Rostech's Utility Management Billing System to manage their customers and billing processes. Data is brought into the GIS system using an ETL process to map customers with the utilities they use in various composite applications.

County Tyler CAD System

Stark County utilizes Tyler Technologies' New World Computer Aided Dispatch system to dispatch emergency services throughout Stark County. The GIS system supplies spatial data for the geocoding of addresses, location validation, indexing, and navigation used in their geocentric computer aided dispatch application. The GIS system also consumes 911 calls related to crime for analysis and mapping.

Maintenance Plan Components

The maintenance plan is comprised of five components: audits, a monthly high level system check, an upgrade schedule, an upgrade plan, and a process for evaluating new technology.

Audits

Audits are performed on each component to provide an inventory of items in that component. They help to determine which items are still needed and how they are performing. Where possible, the collection of information about the system components is automated, and the information is reviewed.

Audit Implementation Workflow

The audit implementation workflow is the process for reviewing a new component. It involves three iterations of an annual or biannual audit, followed by continued enhancements. Audits are scheduled either 6 months or 1 year apart, which allows time to refine the approach and brainstorm new ideas.

- **1st Audit: Inventory** – The first audit focuses on creating an inventory of all of the items that comprise the component being reviewed.
 - Create a list of all of the pieces that make up that component.
 - Document information about the component pieces.
 - Example: the first Python audit involved making a list of all our Python scripts, where they were stored, and when they ran. During this initial inventory, each script was examined and compared in order to determine a way to standardize them and develop a common code base.
- **2nd Audit: Check-up** – The second audit utilizes the inventory to verify that all the pieces are still working, and whether each piece of the component is still needed.
 - Unneeded pieces are deprecated.
 - Remaining pieces are standardized.
 - Example: the second Python audit utilized the inventory to validate whether each script was working, fix the scripts that were not working, and deprecate the scripts that were no longer being used. Adjustments were also made to the code standards to allow for more efficient code debugging and to have better error reporting.
- **3rd Audit: Performance** – The third audit builds upon the prior two audits, looking for areas to improve, including advancements in technology and optimizing performance.
 - The inventory is reviewed.
 - The pieces are checked to ensure they are working.
 - Performance and new technology are evaluated for improvements.
 - Example: the third Python audit involved evaluating how SQL triggers could be used in a SQL database to replace the functionality of existing Python scripts. The inventory was reviewed to identify and document scripts that used a search cursor. One method of calling a search cursor was being deprecated, so this list would be useful in the future. Lastly, a code repository was implemented to better manage and track changes to code.
- **Audit Enhancement Workflow** – Audits after the first three audits focus on improving the review procedure. Audits follow a cycle of maintaining the system, improvements to audit workflow, and adaptations as technology changes. The audit enhancement workflow is listed below:
 - **Brainstorming** - During the current audit, identify ways to improve the process. Consider new technologies with a colleague. Document what was discussed.
 - **Procedures** – Write procedures for the audit enhancement. This will take the results of the brainstorming step and put them into an actionable item during the next audit.
 - **Execute** – During the next audit, execute the procedures as laid out.
 - **Refine** – Refine the procedures as they are executed.

- **Implement** – Discuss the new procedures performed during the audit. Evaluate whether the procedure was beneficial and document any changes that need to be made. Implement the new procedure by adding it to the audit process.

Audit Schedule

An audit schedule was created to distribute the review of each GIS component throughout the year. Audits are scheduled on either an annual or biannual basis. Some audits are scheduled for one week, with shorter audits being scheduled together to take up a whole week. The following criteria were taken into consideration when scheduling the audits:

- The amount of work to perform the audit.
 - This impacts how long the audit would take with the goal of keeping all audits to under a week.
- The frequency of change related to the component.
 - This impacts whether or not the audit was scheduled annually or biannually
- Esri's release schedule was considered, but had little influence on when audits are scheduled and has a larger influence on the upgrade schedule.

The audit schedule can be found in Appendix 2: Audit Schedule.

Python Audit

The Python Audit occurs biannually and provides an opportunity to evaluate the Python scripts that support the GIS system.

Goals:

- Check Python scripts to ensure they are working properly.
- Determine if there are any scripts that are no longer being used and if so, deprecate them.
- Review any changes that need to be made to the Python scripts due to changes in technology.
- Implement any other necessary changes.
- Upgrade ArcGIS Pro on the server that runs the Python scripts.

ArcGIS Server Audit

The ArcGIS Server Audit occurs biannually and provides an opportunity to evaluate the services that exist on ArcGIS Server.

Goals:

- Ensure that each service has the same number of instances between the production and staging ArcGIS Servers.
- Ensure that most services have the same minimum and maximum instances, with services having a minimum of 0 and maximum of 1 instance as the exceptions.
- Examine service performance and tune down underutilized services.
- Examine unused services and tune down those services.
- Examine services with high usage and tune up those services.
- Examine services that no longer exist but are still getting requests. Remove layers from any web maps that contain items or URLs referencing the service.
- Investigate services that are not found in any maps or apps and consider stopping them.

- A summary of the actions taken during this audit are produced showing the changes in minimum and maximum instances.

ArcGIS Enterprise Lineage Audit

The ArcGIS Enterprise Lineage Audit occurs annually and provides an opportunity to evaluate the ArcGIS Enterprise Lineage Reports on SQL Server Reporting Services (SSRS). Python scripts used to audit lineage components is reviewed during the Python Audit. The database that stores data gathered by those scripts is reviewed during the ASSCA Audit.

Goals:

- Ensure that the each report is returning the intended information.
- Adjust any filters and parameters.
- Add new functionality to the reports.
- Make any other changes to the ArcGIS Enterprise Lineage.
- Update documentation.

ArcGIS Online and ArcGIS Enterprise Audit

The ArcGIS Online and ArcGIS Enterprise Audit occur biannually to provide an opportunity to evaluate items on ArcGIS Online and ArcGIS Enterprise.

Goals:

- Confirm items are shared appropriately and update sharing for those that are not.
- Validate service URLs in web maps and change any URLs that are invalid.
- Investigate items with “Test” in the tags or title and delete items that are no longer used.
- Investigate items marked as “Deprecated” and delete items that are no longer used.
- Brainstorm additional ways to audit and curate content on ArcGIS Online and ArcGIS Enterprise.
- Generate a summary of items that were modified or deleted during the audit.

Automated SQL Server Component Audit (ASSCA)

The Automated SQL Server Component Audit occurs biannually and provides an opportunity to evaluate custom stored procedures, tables, and views that are used in the SCGIS System SQL Server environment.

Goals:

- Create and maintain an inventory of custom stored procedure, tables, and views.
- Evaluate if the stored procedures, tables, and views are still working.
- Deprecate components that are no longer being used.
- Brainstorm additional ways to audit and improve stored procedures, tables and views.

GeoEvent Audit

The GeoEvent Audit occurs annually and focuses on the maintenance of ArcGIS GeoEvent Server and its components.

Goals:

- Create and maintain an inventory of the inputs, services, outputs, GeoEvent definitions, and data stores on the ArcGIS GeoEvent Server.
- Evaluate components to verify they are still working.
- Deprecate components that are no longer being used.

Geoprocessing Tools (GP Tools) and Geoprocessing Services Audit (GP Services)

The Geoprocessing Tools and Geoprocessing Services Audit occurs annually and provides an opportunity to review custom geoprocessing tools and services in the GIS system.

Goals:

- Create and maintain an inventory of custom geoprocessing tools and services published to ArcGIS Server.
- Evaluate components to verify they are still working by running them in web maps.
- Deprecate components that are no longer being used.

SCGIS User Audit

The SCGIS User Audit occurs annually to provide an opportunity to review the users who have access to the GIS system. The following areas of the GIS system will be evaluated:

- SQL Server
- Geodatabases
- ArcGIS Server
- ArcGIS Enterprise
- ArcGIS Online
- ArcGIS Hub

Audits will be performed to look at the last time users logged in and verify that users have the appropriate permissions assigned.

Goals:

- Create and maintain an inventory of users that access the GIS system.
- Evaluate the permissions of the users to confirm their access is appropriate.
- Deprecate users that no longer require access.

Monthly High-Level System Check

The Stark County GIS System Maintenance Team meets monthly to perform a high-level check on the GIS system. During this meeting, ArcGIS Server logs are reviewed for errors and server instances are reviewed to ensure they are below the threshold. ArcGIS Monitor is reviewed for system performance and utilized to focus on a single component of the GIS system to become more familiar with that component's normal usage.

Server Log Review

The Server Log Review consists of reviewing the results of a script which uses the System Log Parser to gather and summarize the server logs from the previous week. The System Maintenance Team reviews the logs to determine if there are any errors that are causing problems on ArcGIS Server. Occasionally, a server log will require more investigation and a support case with Esri will be opened to learn more about the error and how to resolve it. Any note-worthy errors or ones that require more investigation are documented in the High-Level System Check meeting notes.

Review ArcGIS Server Instance Summary

The ArcGIS Server Instance Summary displays the number of minimum and maximum instances for all services that are started on all servers in the GIS system. Production, staging, and load balanced servers are evaluated to ensure that minimum and maximum instances are the same. The maximum instance of all servers is checked. If a server has more than 240, the services on the server will be reviewed and the maximum instances will be adjusted to lower the total amount.

Review Production Script Audit Email

The Production Script Audit Email is the result of a python script that checks a directory for logs generated by our python scripts. The python script aggregates information about the logs and sends the gis system maintenance team a weekly email to notify the team of the results of the scripts for the past week. If any scripts are not running at their expected frequency they will be highlighted in red in the email so that the gis system maintenance team can troubleshoot further. During a system check meeting, the System Maintenance Team will review the email, and assign scripts that need to be investigated to a team member.

Review System Maintenance Tools

The gis system maintenance team utilizes several tools in order to effectively maintain the GIS system. The review of System Maintenance tools during the monthly system health check provides an opportunity to ensure that select tool are running appropriately. Each of the identified tools will be tested, and if anything is not working properly it will be assigned to a team member for review.

ArcGIS Monitor Component Review

The ArcGIS Monitor Component Review utilizes ArcGIS Monitor to check the health, performance, and usage of components of the GIS system. It allows the System Maintenance Team to become more familiar with a new components in ArcGIS Monitor. During a system check meeting, the System Maintenance Team will review a different component, and follow the workflow below for reviewing that component.

- Select a new component on ArcGIS Monitor.
- Understand what the component is indicating about GIS system.
- Figure out if the component will be useful going forward.
- Write procedures to incorporate the new component into future meetings.

ArcGIS Monitor System Review

The ArcGIS Monitor System Review focuses on utilizing ArcGIS Monitor to check how the ArcGIS system is performing. The items below are the focus of this review:

- **Alerts** - ArcGIS Monitor is used to review the collections alerts, which will indicate if there is an issue with anything that is being monitored. The System Maintenance Team will look for alerts that are open and have a “critical” or “warning” level.
- **Server Performance** - ArcGIS Monitor is used to review the server performance by reviewing the following reports:
 - **RAM** - Provides a chart showing the random access memory (RAM) available on each server.
 - **Disk** - Provides a chart showing the disk space available on each server.
 - **Processor** - Provides a chart showing the processor usage of each server.

GIS System – Windows Server Updates

The Stark County Information Technology Department has recommended regularly applying Windows updates to all Windows servers in an effort to maintain server security. The System Maintenance Team schedules these updates for the third Friday of the month at 10:00 p.m. to reduce disruptions to users. On the Monday prior to the Windows update, an email is sent to users notifying them of the intermittent outage at that time. In addition to the email, the information banners on ArcGIS Online, and ArcGIS Enterprise are updated with the date and time of the maintenance window. A procedure is followed to ensure that all of the servers are updated properly, efficiently, and safely. Once the Windows updates are completed, the information banners are removed until the next month.

Upgrade Schedule

The System Maintenance Team established an upgrade schedule and the created guidelines to follow when planning upgrades. In order to accomplish this goal the following points were considered:

- Esri’s current release schedule occurs during the months of March and July.
- The July x.x.1 release typically has a longer support cycle.
- Occurrence of patch releases to fix bugs.
- Scheduling with the Stark County IT Department.
- Scheduling during a time of low utilization, possibly in December when staff takes vacation for the holidays.
- Avoidance of major events that rely heavily on the GIS system like reappraisal or elections.
- Weighing the business needs of Stark County.
- Weighing the risk of upgrading.
- The necessity to properly vet new functionality due to the limited documentation regarding the new functionality of new releases.
- Attempting to stay no more than four releases behind.

After significant consideration, it was decided to upgrade development servers first when a new version is released and to wait to upgrade the staging and production servers only once a year. This would allow the development server to be used for testing and bug-finding before staging or production would be upgraded. Below are the upgrade schedules:

- **Biannual Development Server Upgrade Schedule**

- Meet the second Tuesday in April to review the new release and schedule the upgrade of the development servers.
- Meet the second Tuesday in August to review the new release and schedule the upgrade of the development servers.
- If the testing and evaluation of the new release proves to be immediately beneficial to the business needs of Stark County, and there is minimal risk, the system maintenance team may recommend upgrading the staging and production servers sooner than what is outlined below.
- **Annual Staging and Production Server Upgrade Schedule**
 - Meet during the ArcGIS Server Audit in November to evaluate the options to upgrade.
 - If the decision is made to proceed with the upgrade, it will be scheduled for December.

Upgrade Plan

As the SCGIS System has grown over the years, it has become increasingly difficult to safely upgrade our GIS Systems. In order to be more strategic about how upgrades are implemented, the System Maintenance Team has considered the following and come up with the following plan for approaching their upgrades.

- Evaluating the benefits of new features, and effort/risk of upgrading.
- The preference is to be no more than 4 releases behind.
- Due to the longer support cycle for the X.X.1 releases, these releases will be favored.
- Consider upgrading development servers at every release to look closer at the release.

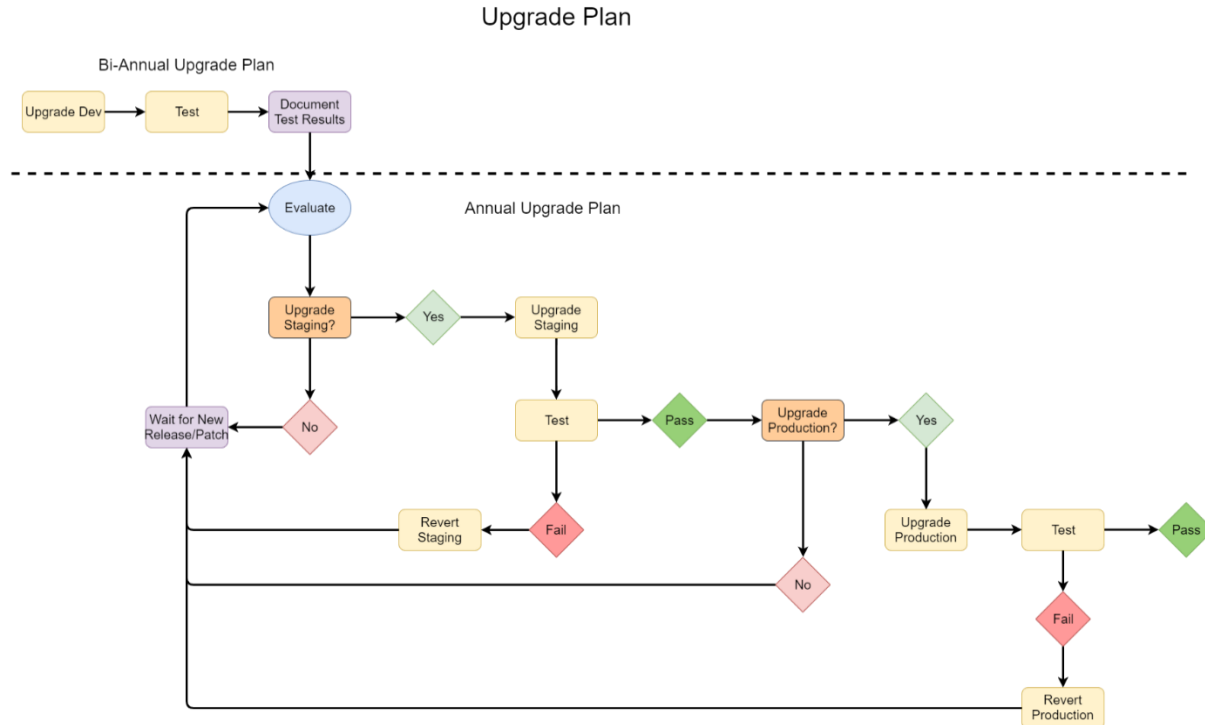


Figure 2

Upgrade Development Servers

A month following the new release, the System Maintenance Team meets to review Esri documentation and blogs regarding the latest release, and then schedule the upgrade of the development servers.

Development Servers Test

During the test phase, the System Maintenance Team works through the mission critical test list to determine if the items on that list are still functioning properly after the upgrade. Any new functionality or updates to existing functionality will be tested to properly vet them.

Document Testing Results

All of the results from the testing phase will be documented. Any further testing will be scoped out, tested, and then documented. This documentation will then be reviewed during the evaluation phase of the annual upgrade plan.

Evaluate

During the evaluation phase of the upgrade plan, the following will be evaluated when looking into a new release:

- Review the documentation created from the development server testing.
- Review the bugs fixed by the release.
- Review the bugs caused by the release.
- Identify business needs that can be improved with the new functionality .
- Weigh the above and decide whether or not to upgrade the staging environment .
 - Do not upgrade at this time: after the above criteria have been weighed, and it is determined that the upgrade will not be performed at this time, then the SCGIS System Maintenance Team will wait for the next release or patch.
 - Upgrade the staging environment: after the above criteria have been weighed, and it is determined that the SCGIS System Maintenance Team will proceed with the upgrade.

Upgrade Staging Servers

To upgrade the staging environment, the System Maintenance Team will follow the following workflow:

- Perform back-up
- Take a snapshot of the servers
- Perform the upgrade
- Verify the system is working

Staging Servers Test

During the test phase, the System Maintenance Team will work through the mission critical test list to determine if the items on that list are still functioning properly after the upgrade. If the testing fails, the staging servers are reverted back to the previous version, and upgrading is postponed until the next version or patch.

Upgrade Production Servers

To upgrade the production environment, the System Maintenance Team will follow the following workflow:

- Perform back-up
- Take a snapshot of the servers
- Perform the upgrade
- Verify the system is working

Production Servers Test

During the test phase, the System Maintenance Team will work through the mission critical test list to determine if the items on that list are still functioning properly after the upgrade. If the testing fails, the production servers are reverted back to the previous version, and upgrading is postponed until the next version or patch.

Process for Evaluating New Technology

As new technology becomes available, the System Maintenance Team will evaluate the technology based on existing workflows, as well as new business needs. The following workflow will be used to evaluate new technology:

Review the Technology

- Understand what the technology is best used for and what existing technology it would replace.
- Perform R&D on the new Technology.
 - Determine if the new technology can perform existing workflows more efficiently.
 - Review new business needs and determine if the new technology will meet those needs.
 - Document the results.
- Scope out the work required to migrate existing processes to the new technology.
 - Weigh out the pros and cons for migrating existing processes to the new technology.

Procurement

The System Maintenance Team will propose the final procurement plan in October for evaluation.

- **Plan throughout the year** - The System Maintenance Team will document needs throughout the year based on the evaluation of system health and the evaluation of new technologies.
 - The procurement proposal will identify why the new technology is needed, the plan for using the new technology, and the cost/benefit savings of the new technology.
 - Immediate needs, that occur throughout the year, will be assessed on an as needed basis.
- **Review in August** - The System Maintenance Team will review the proposals throughout the year, finalize the proposals, and prepare the proposal for evaluation by management.
- **Propose the final procurement plan in September** - The final procurement proposal will be presented to management for approval. The approved items will be purchased and implemented. Any of the rejected purchases will be reevaluated and when appropriate, incorporated into the following year's proposal.

Implementing

The System Maintenance Team will use the scope outlined before to implement the new technology, and document its usage.

Audit

After the new technology is implemented, the System Maintenance Team will schedule an audit during the next audit cycle. At that time, the System Maintenance Team will follow the audit implementation workflow outlined above.

Tools

Several tools were created in order to effectively maintain the GIS system.

Python Scripts

Replica Audit

The Replica Audit script queries all geodatabases in the GIS system to identify the items that are replicated. The first step of the process is querying the replica dataset ID in the geodatabase items table. Next the returned records are looped through and capture the physical name and query the GDB Items table for the physical name and the data type not equal to the replica dataset ID. Then we capture the item type, and item type name. Then the results are written to a table. If a GDB has no replicated datasets, nothing is written.

Geodatabase Audit

The Geodatabase Audit script queries all geodatabases in a GIS system to gather information about the items in the database. The first step of the process is to access the GDB_ITEMS table, and export the table to a scratch file geodatabase. Then definition and documentation fields are deleted because they do not work in Excel. The process accesses the GDB_ITEMTYPES table and exports the table to a scratch GDB. Finally, the Join Field Management geoprocessing tool is run to bring the two tables together, and is then the results are written to a table.

List Map List Layer Data Source Audit

The List Map Layer Data Source Audit script identifies the data source of layers published in a map service to ArcGIS Server. If the layer contains data from an SDE database, it will list the database name, feature dataset, and feature. Layers from other data sources will have the full path to the data set. Results are written to a table.

Service Audit

The Service Audit script uses Rest API to query ArcGIS Server and return information about the maps services published there. Map service name and information is written to a table, creating an inventory of all map services in the GIS system.

Item Audit

The Item Audit script uses ArcGIS Python API to query an ArcGIS Online or ArcGIS Portal organization and return the items on those organizations. Information about the item is retrieved. The item name and information is written to a table, creating an inventory of all items in all portals.

Web Map Audit

The Web Map Audit script uses ArcGIS Python API to query an ArcGIS Online or ArcGIS Portal organization for web maps on those organizations. The script loops through the layers in the web map, retrieving information, and service URLs. The web map name and information is written to a table, creating an inventory of layers in web maps.

Web Map Service Validation Audit

The Web Map Service Validation Audit script uses ArcGIS Python API to query an ArcGIS Online or ArcGIS Portal organization for web maps on those organizations. The script loops through the layers in the web maps, returning the service URL for each layer. It uses an HTTP post request to check the validation of the service URL and identifies the URLs that are not working and writes those layers to a table.

Group Audit

The Group Audit script uses ArcGIS Python API to query an ArcGIS Online or ArcGIS Portal organization for groups on those organizations. The scripts lists items shared to each group, along with details about the group. This information is written to a table, creating an inventory of groups and their items.

User Audit

The User Audit script uses ArcGIS Python API to query an ArcGIS Online or ArcGIS Portal organization for users on those organizations. Information about the users are returned and results are written to a table.

Web Application Audit

The Web Application Audit script uses ArcGIS Python API to query an ArcGIS Online or ArcGIS Portal organization for web applications on those organizations. The script returns the JSON of the web application. Information about the web application is retrieved, along with any web maps that are referenced by the web application. The information about the web applications and web maps are written to a table.

Widgets Audit

The Web Application Widgets Audit script uses ArcGIS Python API to query web applications on an ArcGIS Online or ArcGIS Portal organization. The JSON of the web application is returned and information on all the widgets in the application is retrieved. Additionally, service URLs used within the configuration of the widgets are also retrieved. This information is written to a table, creating an inventory of all widgets in web applications.

Python Script Data Source Audit

The Python Script Data Source Audit script accesses the code of Python scripts and lists the connection files, feature datasets, and feature classes that are referenced within each script.

ArcGIS Monitor

The System Maintenance Team uses ArcGIS Monitor to monitor the entire GIS system to provide information about system health, usage, and performance.

ArcGIS Monitor Excel Report Extension

The ArcGIS Monitor Excel Report Extension summarizes the statistics over the last 6 months and is used during the ArcGIS Server Audit.

SQL Server Reporting Services

SQL Server Reporting Services (SSRS) is a web based tool that allows users to create, and view paginated reports. These reports are used to view the audit data that is created by Python scripts and allow the System Maintenance Team to view and filter data.

ArcGIS Enterprise Lineage

The ArcGIS Enterprise Lineage is an SSRS report. It references a SQL view that shows the relationships between the data in SDE databases, the map services that consume that data, as well as the web maps, applications, and widgets that utilize those services. The ArcGIS Enterprise Lineage is used to understand how changes to one component of the GIS system will affect the other components that are related.

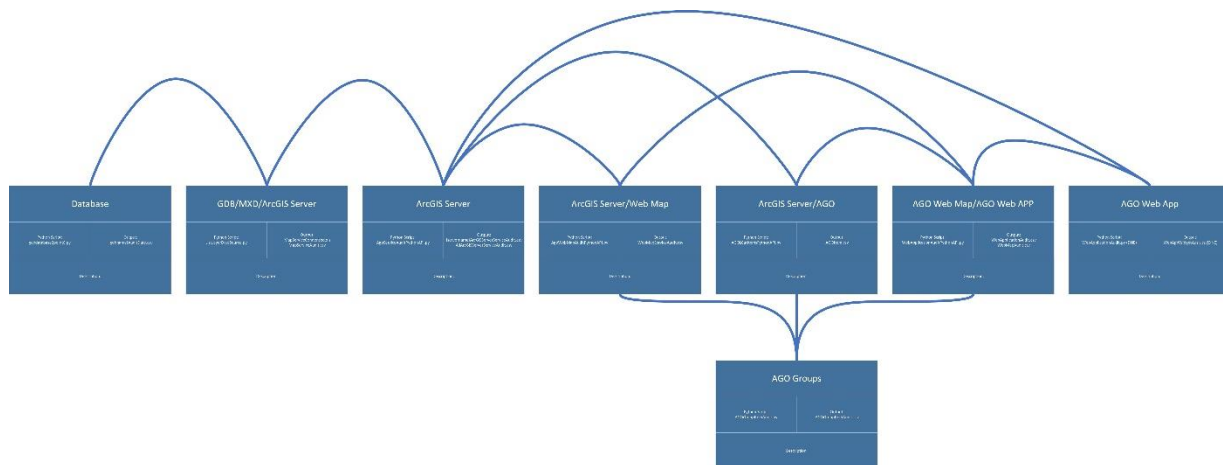
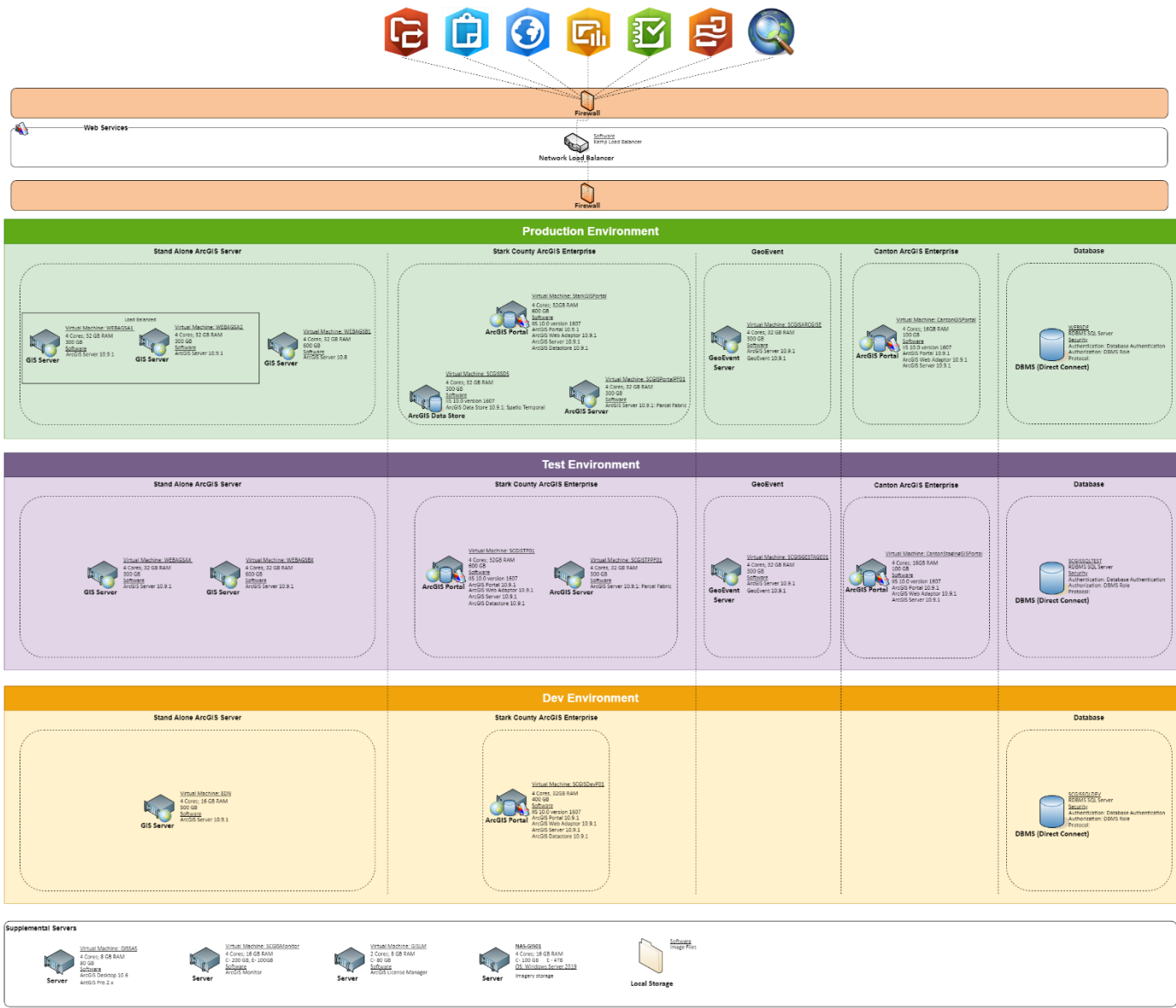


Figure 3

Appendix 1: Stark County GIS System Diagram



Appendix 2: Audit Schedule

Month	Server Planning	Application/Web Map Usage	ASSCA	GP tools	GP Services	ArcGIS Lineage Audit	Python Scripts	GeoEvent	System Upgrades	GIS User Audit	Esri Releases*
January								X			
February							X				
March				X	X	X					Desktop/ Enterprise
April			X								
May	X	X									
June										X	
July											Desktop/ Enterprise
August							X				
September											
October			X								
November	X	X									
December									X		

*The Esri Release Schedule is subject to change. We cannot control them.

Appendix 3: Audit Procedures

All of our Audit procedures, listed below, are available upon request by emailing gis@starkcountyohio.gov

- ArcGIS Enterprise Lineage Audit
- ArcGIS Online and ArcGIS Enterprise Audit
- ArcGIS Server Audit
- Automated Sql Server Component Audit
- GeoEvent Audit
- GP Tools and Services Audit
- Python Script Audit
- SCGIS User Audit