



Supporting GIS

Best practices for Incident Management and Daily Operations

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Agenda

- **Introduction & History of GIS at PG&E**
- **PG&E GIS Environment**
- **New Service Readiness Setup**
- **Current Support Structure & Process**
- **Support Documentation**
- **Reporting & Metrics**
- **Support Team**
- **Maintenance and Trouble-Shooting Suggestions**
- **Further Information**
- **Q&A**



PG&E by the Numbers

1905

Year PG&E was formed



5.3 million

Electric customer accounts



18,616

Circuit miles of electric transmission lines

10

PG&E Employee Resource Groups (ERGs)



4.3 million

Natural gas customer accounts



67

Hydroelectric powerhouses



141,215

Circuit miles of electric distribution lines

19

Division Leadership Teams



42,141

Miles of natural gas distribution pipelines

6,438

Miles of gas transmission pipelines



3 million

Customers who get clean energy from Diablo Canyon Power Plant

\$1.1 billion

Total annual economic impact in California from Diablo Canyon

3,896

Total generating capacity of PG&E's hydroelectric system in megawatts



\$302 million

Property taxes and franchise fees PG&E paid to 49 counties and 243 cities in April 2014

\$22 billion

Economic activity contributed by PG&E in 2012



795

Teenagers who got workforce training thanks to PG&E Summer Jobs program



215

Teenagers who had paid summer jobs thanks to PG&E Summer Jobs program

23,000
Employees



\$2.3 billion

PG&E spent on diverse suppliers in 2013, a new record



90

Years that PG&E's Emeryville Repair Shop has been in operation



History/Overview of Electric GIS at PG&E

- **Scope:**
 - The Electric Distribution Asset Management /Geographic Information System (ED AM GIS) project will enhance and convert PG&E ED asset data into a centralized GIS that is integrated with SAP.
 - The future state is to have a single, integrated system that serves as PG&E's master database of asset records.
- **Current Status:**
 - Deployed to two out of the four PG&E regions - replacing all existing electronic and paper maps.
 - Deployed web-based viewing application to support user groups in estimating, engineering, construction, and operations.
 - Deployed the interface to SAP to help maintain synchronized assets and asset data.
- **Next Steps:**
 - Deploy to final PG&E Regions
 - Retire Legacy Systems



Environment Review

- **Solution**
 - **ArcMap/ArcFm for mapping**
 - **Access via Citrix**
 - **Web Portal for general viewing**
- **Many infrastructure environments**
 - **Production – nine different databases including**
 - **Publication, Maintenance, Batch, Schematics, etc.**
 - **Non-Production – over twelve separate setups**
 - **Dev, Test, Training, Sandbox, QA, Conversion, etc.**
- **Integration Points**
 - **Outage Management System, Distribution Management System**
 - **Linked to SAP for asset information**
- **Nightly batch jobs**
 - **Database Maintenance**
 - **Database Export/Import and GDB Replication**
 - **Map Production**
 - **Interface synch jobs to Non GIS Systems**



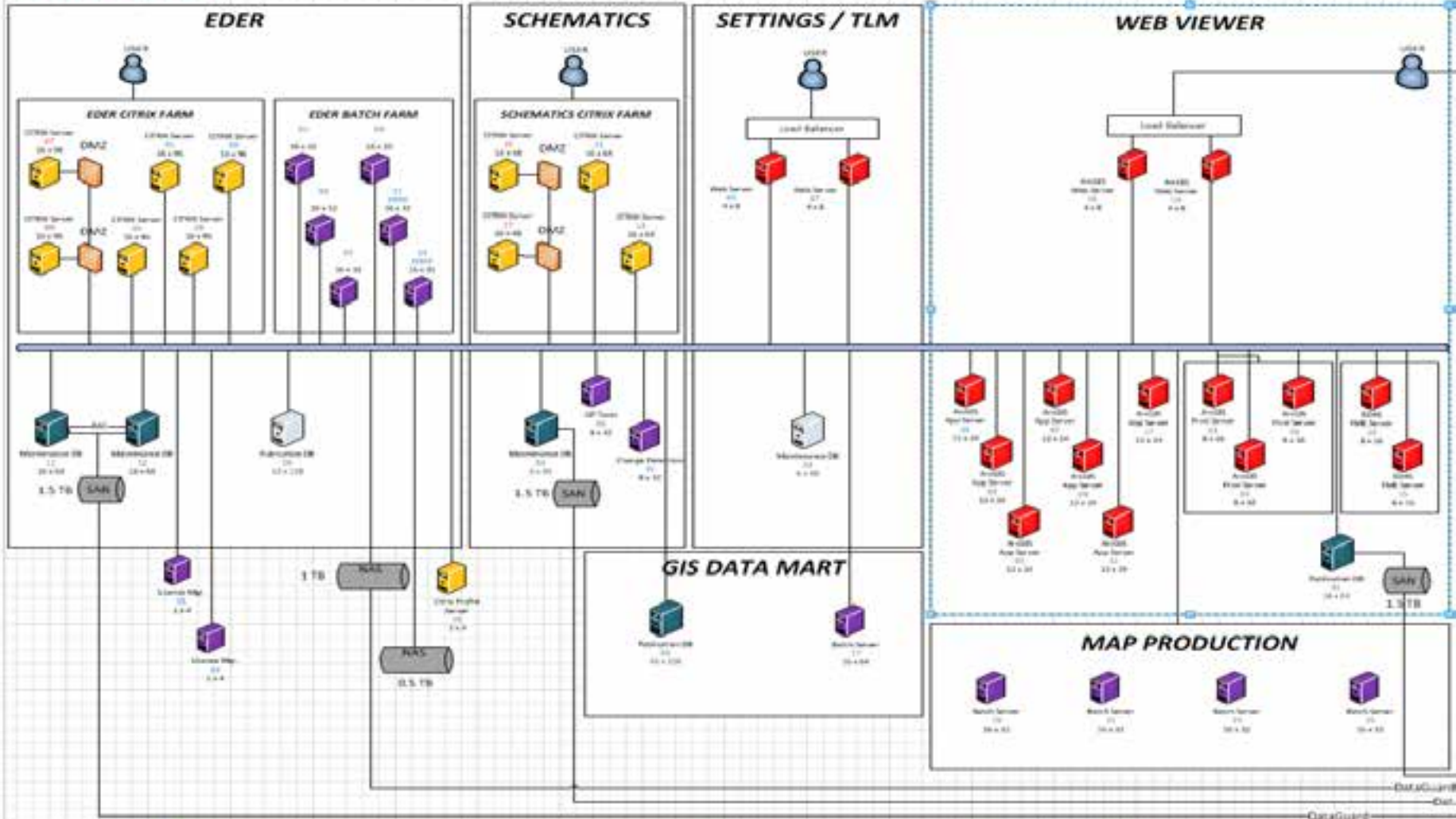
Infrastructure Diagram

ED AM/GIS PROJECT PRODUCTION INFRASTRUCTURE LANDSCAPE

	SP/APP (WINTEL)
	CTRM Server (L)
	APP/BATCH/DB/INTL (WINTEL)

78	WinTel Servers
50	AIX LPARs
18	DB Instances

Data Center 1



New Service Readiness

- **Incident**
 - An unplanned interruption to an IT Service or a reduction in the Quality of an IT Service
 - For example a system or application down event.
- **Service Request/Work Order:**
 - A request from a user for information, or advice, or for a Standard Change or for Access to an IT Service.
 - For example to reset a password, or to provide standard IT Services for a new User.
- **Help Desk Support Objectives**
 - Provide a first line, single point of contact, for supporting and resolving service interruptions as quickly as possible
 - Ensure that issues raised by end users are resolved in a reasonable time set for criticality classifications based on SLAs
 - Provide issues tracking reports daily, weekly, and monthly to monitor progress of issues resolution
 - Help prevent recurrence of problems



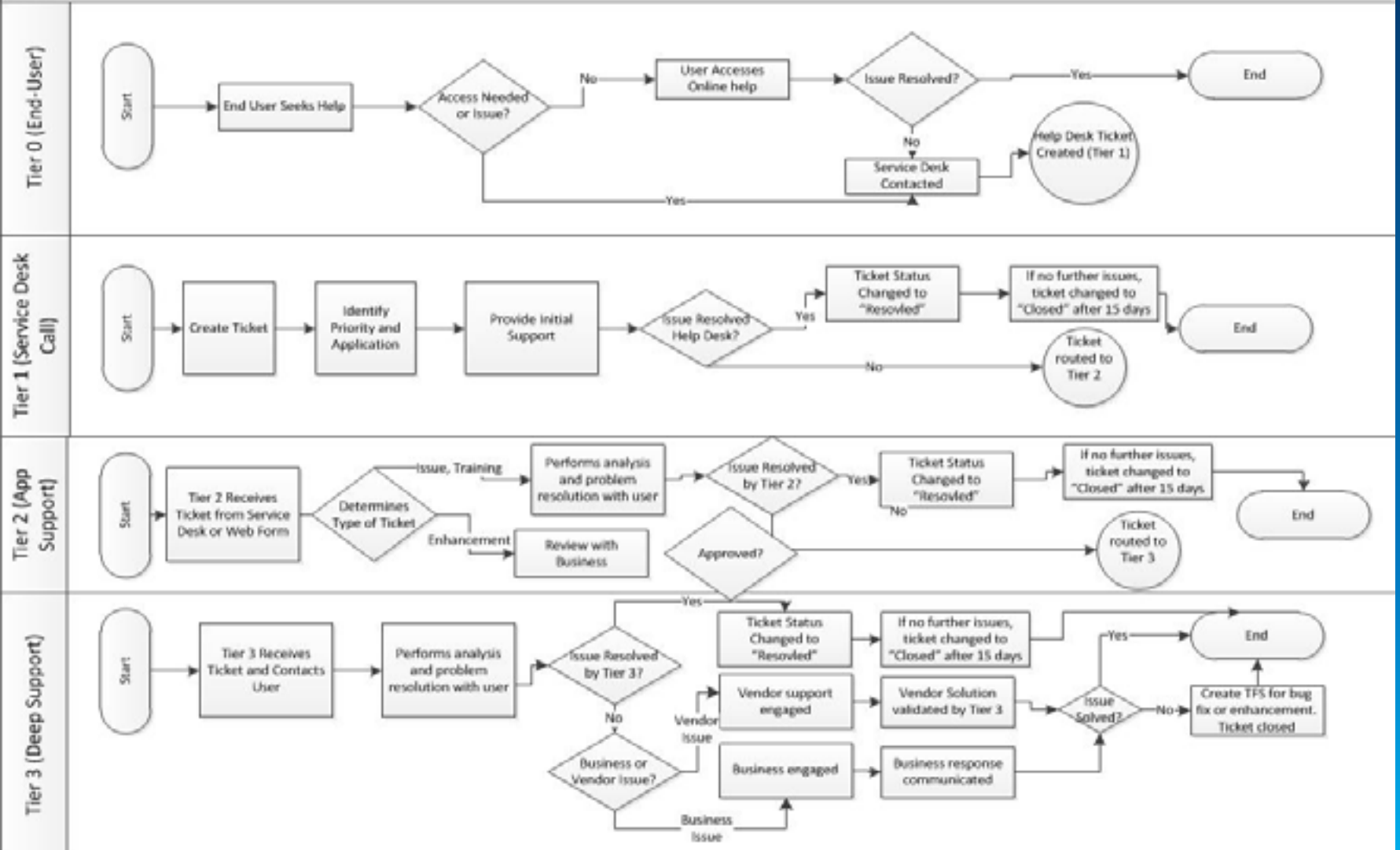
Support Structure & Process

- **Tiered support**
 - **Tier 1 - Help Desk**
 - Take end user calls, identify issues, prioritize
 - Attempt First Call Resolution using FAQ and KDB (Knowledge Database) Tools
 - **Tier 2 – GIS Support Team**
 - Provide workaround or break/fix based on support documentation
 - **Tier 3 – GIS Application and Database Technical Support Team**
 - Bug fixes and new requirements
 - Root cause analysis of critical tickets
 - Prevent known problems in future releases



Incident Management Process Flow

Tiered Level Support View



Service Desk Documentation (Maintained on SharePoint site)

- **Run/Play Books**
 - **RunBook** contains information about the environment in order to understand, monitor and fix the application as needed
 - **PlayBook** is a prescriptive guide documenting the tasks needed to trouble-shoot an issue
- **FAQ (quick tips)**
 - **List of common issues**
 - **Reset Passwords, Unlocking Accounts, etc.**
 - **Quick reference links**
 - **Support URL's, Active Directories, etc.**
- **SLA**
 - **Business criticality**
 - **Application availability**
 - **Response time**
 - **Recovery time**



Reporting and Metrics

- **Sample Monitor Scripts**
 - **ArcGIS Server Excess Process Check**
 - Checks task list on servers for too many of same process.
 - **GDBM Health Check**
 - Checks GDBM logs for failure search terms "error, Error processing".
 - **Mxdperfstat Check / PerfQA Analyzer**
 - Performance check based on a default mdx file/ Store Display.
- **Help Desk Reporting**
 - Total number of tickets by type, status, category, assignment group, etc.
 - Ticket aging by week
 - Weekly delta report
 - SLA Report

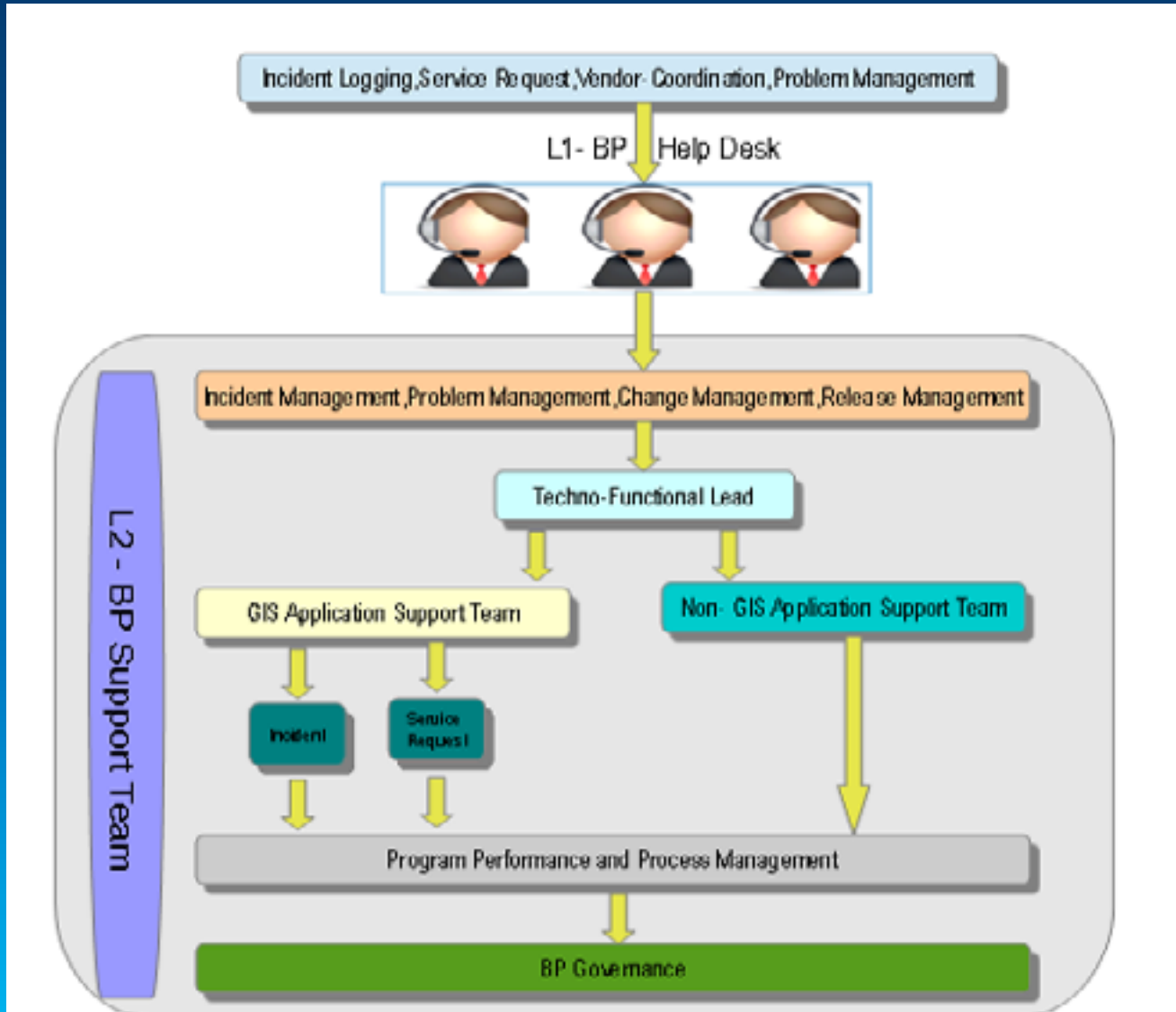


GIS Support Team

- **Support team provides end-to-end support for enterprise GIS applications.**
 - Monitor batch jobs
 - Support end user queries and issues
- **Serves as a link between Application Development, Maintenance, and Infrastructure .**
- **Handles end user Performance queries, does initial analysis of issues.**
- **Coordinates across various teams such as Database, Application, Network and Citrix.**
- **Proactively notify the business and application release team of any known issues and risks.**



Support Team Structure



Initial Triaging Steps

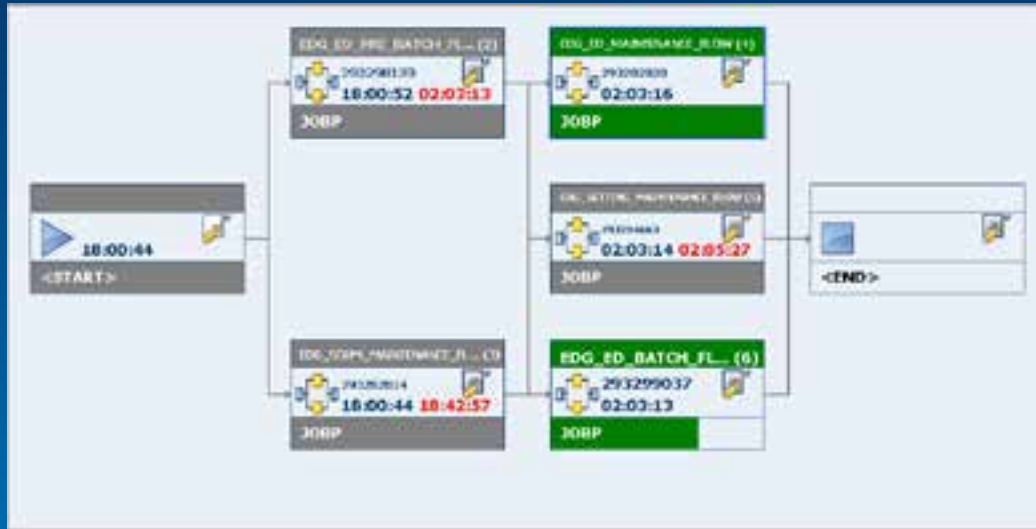
- **Contact User for more information (login to system if necessary)**
- **Determine Environment (Production /Non Production)**
- **Determine scope (one or more users or entire system)**
- **Replicate (Yes/No)**
- **Determine issue: Bug, configuration, access, data, etc.**
- **Determine solution: Workaround, FAQ, Training, etc.**
 - **Get customer confirmation to close ticket**
 - **OR Escalate to higher level of support**
 - **OR Route ticket to different workgroup**

Enterprise Batch Job Scheduler - UC4

- **UC4 Workload Automation Software Tool is an enterprise job scheduling platform that is used to manage, monitor, control and synchronize GIS applications with PGE IT.**
- **Enables one to create intelligent, automated end-to-end IT processes and spans over multiple GIS applications and operating systems.**
- **Improves GIS data processing, such as automating processes that were previously manual.**
 - **Data Reconciliation, Data Posting, Managing GDBM services, Web Services and GIS data Maintenance**
- **Ability to check, validate jobs and notify on failures to support team.**
- **Ability to schedule multiple jobs with flexibility and complexity.**



UC4 Job Scheduling



Infrastructure Maintenance

- **Update Operating System Patches, Firmware updates and Database patches**
 - **Start with Lower environments before applying in Production environment.**
- **Verify compatibility of OS Patches with GIS Product Vendor.**
- **Plan user load against infrastructure capacity.**
- **Tune Application - with help of Database Admins and Infrastructure Admins**
 - **Start with Lower environments first and then implement recommendations in Production.**
- **Documenting Change management properly in order to help in issue troubleshooting.**



Business Service Management – Monitoring Details

HP Business Service Management (running on bsm.utility.pge.com) - Windows Internet Explorer

eNOC - My BSM

MyBSM Applications Admin Help Site Map

300° View Performance Perspective Custom Image Select Page

POE_Electric_Operation [Select a Filter]

Name	Business Impact	Status	Acknowledge	System			Application		Software		Last Status
				System Availability	System Performance	Legacy System	Application Performance	Application Availability	Software Availability	Software Performance	
Infra_I		✓		✓	✓	-	-	-	-	-	6/29/2015
Infra_E		✓		✓	✓	-	-	-	✓	✓	6/29/2015
(App)	-	✓	-	-	-	-	-	-	-	-	-
		✓		✓	✓	-	-	-	-	-	6/29/2015
		✓		✓	✓	-	-	-	-	-	6/29/2015
		✓		✓	✓	-	-	-	-	-	6/29/2015
		✓		✓	✓	-	-	-	-	-	6/29/2015
		✓		✓	✓	-	-	-	-	-	6/29/2015
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		✓		✓	✓	-	-	-	-	-	6/29/2015
		✓		✓	✓	-	-	-	-	-	6/29/2015
(Batch)	-	✓	-	-	-	-	-	-	-	-	-
(Ctrl)	-	✓	-	-	-	-	-	-	-	-	-

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Application & Network Maintenance

- **Update Application Patches as required and test them in lower environments first**
- **Coordinate with Infrastructure and Operations Teams to improve performance and System Availability**
- **Validate Network Connectivity between Database Servers and Application Servers**



Database Maintenance

- **Implement DBA Recommendations as required**
- **Create and schedule jobs to Gathers statistics and Rebuild Indexes**
- **Reconcile GDB Versions**
- **Delete orphan Versions and Schedule Geodatabase Compress**
- **Run PerfQA Analyzeer, Mxdperfstat and establish benchmarks**
- **Monitor SDE state lineages**
- **Monitor Database for TOP activities**



For Further Information

- **ITIL (IT Infrastructure Library)**
 - From website: “...a series of documents that are used to aid the implementation of a lifecycle framework for IT Service Management.”
 - <http://www.itil.org.uk/index.htm>
- **Mxdperfstat**
 - <http://www.arcgis.com/home/item.html?id=a269d03aa1c840638680e2902dadecac>
- **PerfQA Analyzer**
 - <http://blogs.esri.com/esri/supportcenter/2014/02/03/calibrating-arcgis-performance-with-perfqanalyzer-new-build-available-for-download/>
- **Email us at:**
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Q & A

- Thanks for your time - Any Questions?

