RIVA SaaS/Managed Services Presentation

May 6th, 2024

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Service Offering Definitions

SaaS

Managed Services

Itron Hosting Service Offering

- Marquette is an Itron hosted customer that purchased a **SaaS** service offering. The SaaS offering is defined as the following:
  - Itron is responsible for the maintenance, availability, and performance of the hosted back-office.
  - Marquette is responsible for the daily operations encompassing the Field Area Network (CGRs and CAMs) as well as endpoint data collection and integrity.
  - Within the SaaS service offering, Itron is responsible for providing a back-office "*Availability*" SLA as well as a "*File Delivery*" SLA.

- Should Marquette elect to have Itron be responsible for the hosted Riva system, Itron would implement full **Managed Services**:
  - Offering includes a "*Read Rate*" SLA
  - Itron is responsible for the Field Area Network as well as endpoint data collection and data integrity.
  - Itron would provide 24x7 365-day support of the Marquette production system.
  - Marquette would be responsible for field operations and MDI accuracy.

Riva SaaS Skillset Overview

Customer Skillset Required for Riva SaaS Service Offering

Task	Network Engineer	Application Engineer/Systems Administrator
Understanding of both IPv4 and IPv6	X	
IPv6 DHCP scopes	X	
NTP and time synchronization	X	
Understand backhaul technologies and communications (Fiber, Ethernet to Fiber, and Cellular)	X	
Deep knowledge and understanding of CGR components (ACTD, GOS, etc.) and their dependency on one another	X	
Knowledge of CGR express configurations…configuration rollback and optimization	X	
Knowledge of packet captures (WireShark)	X	X
Knowledge of Cisco IOS and how to upgrade IOS firmware (including GOS firmware upgrades	X	
Understand firewall ports and rules to facilitate Ethernet and fiber backhaul	X	
Knowledge of CGR PKI…certificates	X	
Understand of the functionality of Field Network Director (FND)	X	X
Application configuration (OW-CM)		X
Deep knowledge of analyzing and troubleshooting interrogation issues to determine root cause from field area network devices and/or application	X	X

Service Offering Comparison

Service Offerings Comparison

Responsibilities	SaaS		Managed Services	
	Itron	Customer	Itron	Customer
Back-office patching	X		X	
Operating System and application upgrades (OW-CM, ISM, FND)	X		X	
Back-office infrastructure monitoring	X		X	
Provisioning endpoints and field devices	X		X	
Cellular backbone relationship with the cellular carrier	X		X	
Read Rate SLA	N/A		X	
System Availability SLA	X		X	
File Delivery SLA	X		X	
Replacing endpoints that are no longer communicating or need RMA processing		X		X
CGR that are no longer communicating or need RMA processing		X		X
Field service operations		X		X
MDI file accuracy		X		X
Endpoint firmware upgrades		X	X	
Endpoint migration analysis and reporting		X	X	
Endpoint to CAM and back office application connectivity troubleshooting		X	X	
Daily communicating meter reporting		X	X	
Endpoint data quality		X	X	
Point to point and multicast analysis		X	X	
CGR IOS Upgrades		X	X	
CGR Cellular interface IPv4 troubleshooting		X	X	
Field device firmware upgrades		X	X	
IPv6 and multicast connectivity troubleshooting		X	X	
Read rate and interrogation analysis and troubleshooting		X	X	
Endpoint to system connectivity troubleshooting		X	X	

Managed Services RACI

Responsibility Table: Daily Operations

P=Primary responsibility
S=Support responsibility

Description of Service or Deliverable	Itron	Customer
Create, monitor and manage read schedules	P	
Ensure any input files are received and processed and output files are delivered to Customer by posting to a SFTP folder, or equivalent, where it can be retrieved by Customer as needed	P	
Manage files on the SFTP server where any export files are delivered. If the SFTP server is Itron's, files should be downloaded nightly and files that have been successfully downloaded and processed are to be removed from the SFTP location within 7 days.	P	S
Perform read rate monitoring and reporting	P	
Perform remote investigation for specific groups of non-communicating Endpoints affected by a common network issue and coordinate field order with Customer as needed.	P	S
Notify Itron in advance when additional devices are planned to be installed. Perform Meter field maintenance; close work orders with Itron.		P
Perform Network Device and Endpoint repair, replacement, or relocation as required.		P
Perform RMA, Processing, Tracking and Performance Reporting for Endpoints and Network devices.	S	P
Administration of the Managed Services platform to Service Levels. This includes VPNs, connectivity and tunnel routing infrastructure	P	

Responsibility Table: Environmental Management 1/2

P=Primary responsibility
S=Support responsibility

Description of Service or Deliverable	Itron	Customer
Manage application user requests for new users and deletion for users no longer involved with the managed system		P
Provide notification in the event of an Itron employee with application access no longer requires access to the managed system	P	
Maintain skill sets necessary to properly support the required Itron technologies	P	
Maintain skill sets necessary to properly support the required Itron network Field operations		P
Administer and monitor infrastructure including but not limited to utilization of CPU, memory, IOPs, and disk space	P	
Manage and troubleshoot the secure network infrastructure components and processes	P	
Administer associated Linux, Unix, and Windows operating systems	P	
Apply Operating System and other 3rd party security patches and critical updates as appropriate.	P	
Maintain and troubleshoot third party software issues required for Managed Services platform operations, work with third party to troubleshoot as required	P	
Maintain anti-virus on all windows-based servers	P	

Responsibility Table: Environmental Management 2/2

P=Primary responsibility
S=Support responsibility

Description of Service or Deliverable	Itron	Customer
Monitor Network and AP communications and support networking troubleshooting activities for the Itron hosting platform	P	
Support solution upgrade activities	P	
Maintain and administer required databases	P	
Establish and manage the wireless backhaul contracts and accounts if applicable.	P	
Manage upload and submission of meter data files; work with Itron when problems are identified		P
Perform regular system, database, and custom component backups in accordance with selected service level	P	
Develop and maintain related standard operating procedures	P	
Manage Endpoint firmware revisions, including coordination and scheduling of firmware downloads as necessary (for Itron manufactured devices only with Itron provided firmware)	P	
Service Management infrastructure and services	P	
Provide evidence for annual SOC 2, Type 2 attestation for Itron Hosting Services	P	

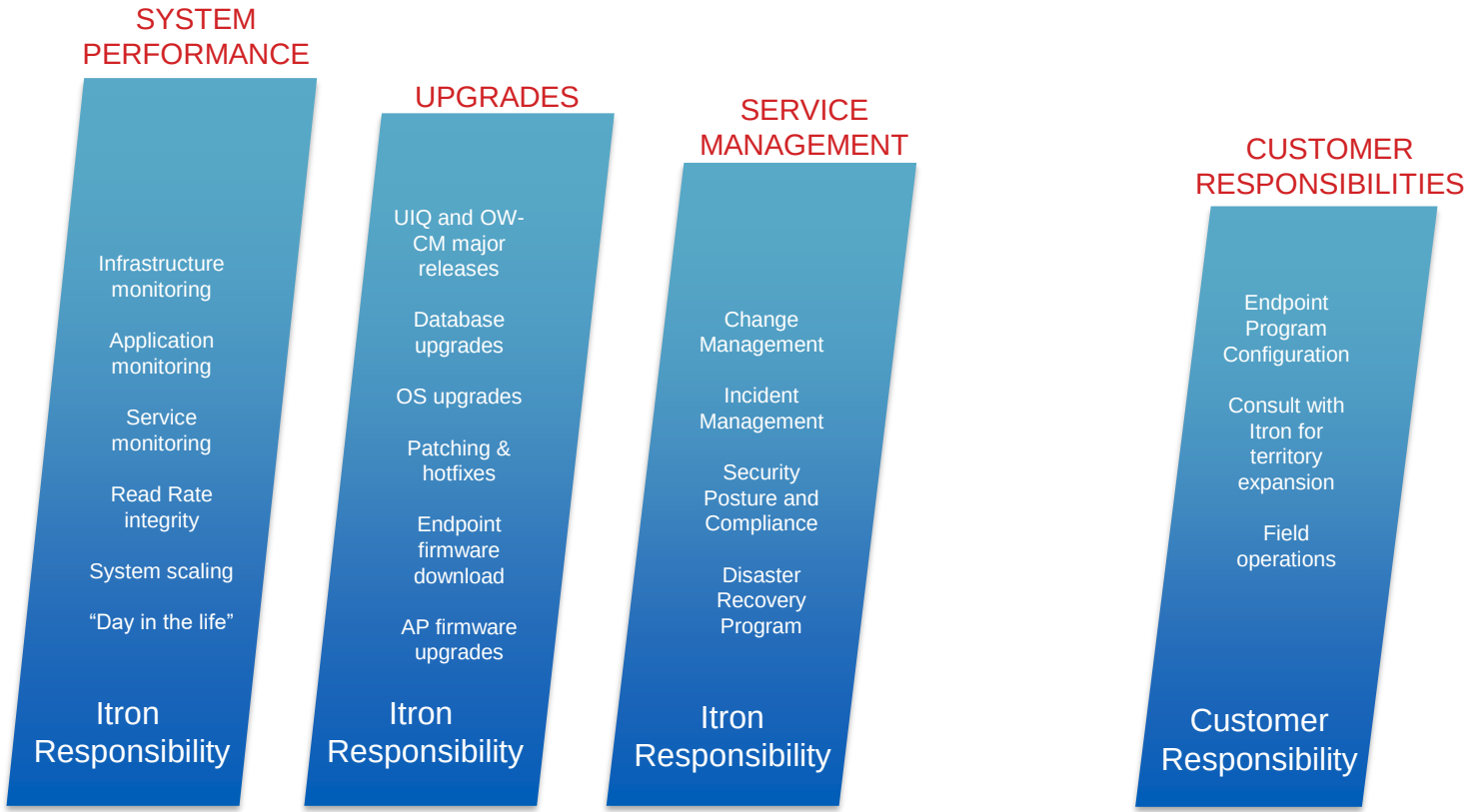
Operational Support Examples

Operational Support

» Ownership and Accountability Per Service Offering

Support Examples	Managed Services	SaaS
Troubleshooting read rate drop for a single interrogation	Itron	Customer
CAM is offline and endpoints migrate to a different CGR resulting in a read rate drop	Itron	Customer
OW-CM major release upgrade	Itron	Itron
Endpoint firmware upgrade after major system release	Itron	Customer
CGR express config is corrupt and CGR is not communicating	Itron	Customer
CAM in two CGRs is not communicating in the middle of the night resulting in a read rate drop	Itron	Customer
New endpoints need provisioning in the system	Itron	Itron
Interrogation performance degradation due to point-to-point only communication	Itron	Customer
MDI file accuracy	Customer	Customer
CGR cellular interface goes down and CGR is not communicating	Itron	Customer
Read rate drops by 10% during the midnight interrogation	Itron	Customer

MANAGED SERVICES – ROLES AND RESPONSIBILITIES



Comparative View of System Access

Managed Service

COMPARATIVE ACCESS TO SOLUTION COMPONENTS

Application\Device	Access Level (Managed Service)
Itron Enterprise Edition (IEE) App Server	U
Itron Enterprise Edition (IEE) DB Server	NA
Itron Analytics (IA)	U
Performance Manager (PM) App Server	U
Performance Manager (PM) DB Server	NA
Action Manager (AM) App Server	U
Action Manager (AM) DB Server	NA
Field Collection System (FCS) App Server	U
Field Collection System (FCS) DB Server	NA
Tunnel Provisioning Server (TPS)	NA
Field Network Director (FND)	RO
Field Network Director (FND) Northbound API	NA
Connected Grid Router (CGR)	NA
CGR Adaptive Communications Technology Module (CAM)	NA
Network Policy Server (NPS)	NA
Active Directory for Device\Endpoint Provisioning	NA
OW Collection Manager (CM) App Server	A
OW Collection Manager (CM) DB Server	NA
Itron Security Manager (ISM) APP Server	NA
Itron Security Manager (ISM) DB Server	NA
Certificate Authority Servers (ECC, RSA, WIFI)	NA

A = Admin Access
U = User Access
NA = No Access
RO = Read Only

COMPARATIVE ACCESS TO SOLUTION COMPONENTS

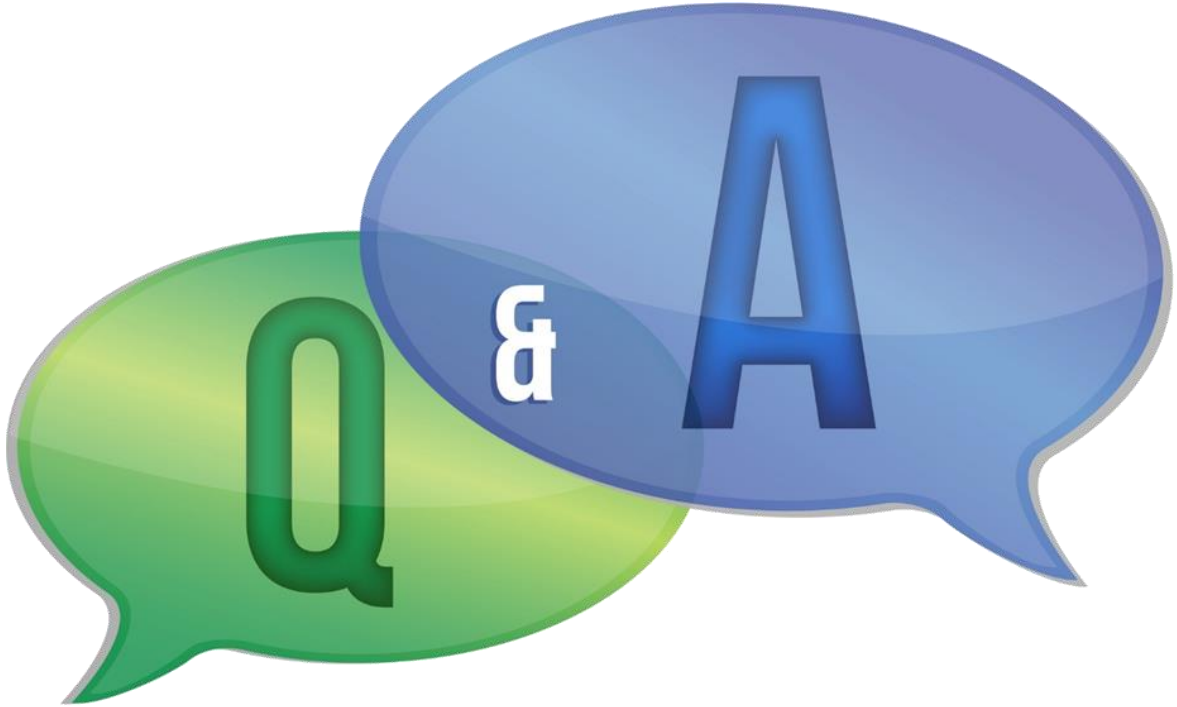
Application\Device	Access Level (Managed Service)
Gemalto HSM	NA
Thales HSM	NA
Infoblox IPv6 DHCP Solution	NA
Headend Router (HER)	NA
MV90 xi User Interface	RO
MV-PBS User Interface	RO
UIQ	U
SLV – Streetlights	U
Gridscape	U
SIQ	U
ODS – Outage Detection	U
Operations Optimizer	U

A = Admin Access
U = User Access
NA = No Access
RO = Read Only

Managed Services Benefits to Marquette

Benefits of SaaS/Managed Services

- Reduction of customer O&M (training, personnel, etc..) expenses
- Leverage Itron's vast experience managing Riva AMI systems
- Itron is responsible for OS, database, and supporting application licensing
- Itron is responsible for upgrading field devices and endpoint firmware
- Marquette shifts focus from AMI IT activities to revenue generating streams
- Itron is responsible for investigating read rate related issues
- Marquette's responsibilities are limited down to MDI hygiene, meter configurations, and field operations (boots on the ground to investigate and/or swap devices and endpoints
- Ease of transition from Riva to a future Itron AMI related product



Questions?

Thank you!!!

Monitoring

WHAT is Monitored: Infrastructure Monitoring

Ensure all infrastructure supporting software and services is available and operating at optimal levels

- Network – routers, switches, firewalls, load balancers
- Server Hardware and Operating System – physical and virtual servers (Dell, UCS, Vmware)
- Database – database technologies in support of Itron software and management capabilities (SQL, Oracle, Greenplum, mySQL)
- Storage – leveraged storage storage-area-network (EMC, Cisco)
- Appliance – hardware and virtual appliances supporting infrastructure services (InfoBlox, Data Domain, RecoverPoint)
- Tools & Services – management tools and applications (BladeLogic, Remedy, vCenter, Monitoring, Splunk, Salesforce, and LDAP)
- Data Center – power distribution units (PDU) health

WHAT is Monitored: Software Monitoring

Ensure application foundations and application-specific devices are available and functioning properly

- Application processes & port availability
- Application data sync and inter-application connectivity
- Application log file update regularity and specific application log-based error conditions
- Neighborhood Area Network (NAN) device availability -- Access Points, Relays, Bridges
- Field Area Network (FAN) endpoint device availability -- Meters
- Hardware Security Modules (HSM) device availability and hardware health
- Value-added infrastructure monitoring based on application performance parameters – application memory, system load, database job status (blocked/broken/waiting)

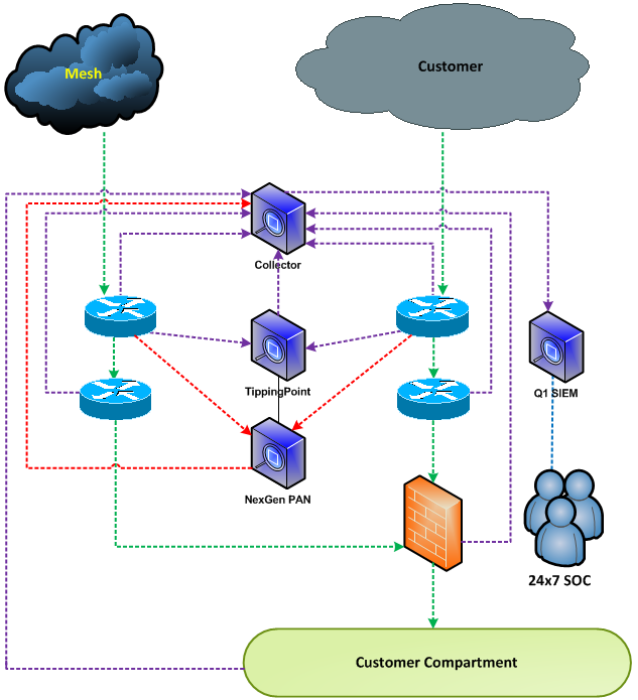
WHAT is Monitored: Service Monitoring

Ensure the primary business outcomes of the service are operating within normal parameters

- Application user interface simulated logins
- Read progress/success for primary read jobs
- Export progress, files, success for primary export jobs
- File delivery
- Remote command failures
- Critical Operations Protector limits
- Security related event logging
- Advanced analysis-based application log and script collection including messaging queue consumption, depth and throughput

Security Monitoring and Detection - Hosting

- Data Sources:
- Network Intrusion Detection (NIDS) –
- Palo Alto Networks (PAN) – NexGen Threat Management
- Deployment ongoing for Corp presence
- In flight for customer deployments
- Security Information & Event Management (SIEM) – Q1 Radar - Syslog
  - AuditD
  - Firewall logs
  - VPN user logs
  - Security appliances



Itron Global Managed Services

Service Offerings
Business Continuity
Disaster Recovery
SLAs

Global Managed Services (GMS) Service Offerings

The **Service Offering** defines the roles and responsibilities of Itron and the customer regarding the hosted environment.

For Itron GMS:

» **Managed Services**

- *Itron hosts the infrastructure and manages the Itron proprietary applications hosted on the infrastructure*
- *UIQ, Riva*
- *Includes read rate, availability, and file delivery*

Service Level Agreement (SLA)

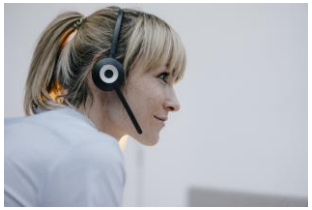
SLA: Level of service from Itron, metrics by which the service is measured, and penalties when the service levels are not achieved.

» GMS Hosting SLAs

- ***On-Demand (default is 98%)***
- ***Read Rate SLA (default is 99.5%)***
  - Predominantly associated with UIQ implementations. A read rate SLA is only associated with head end systems (HES). IEE does not provide a read rate.
- ***File Delivery SLA (default is 99%)***
  - Related to the delivery and integrity of a billing file from a head end system or a meter data management (MDM) system like IEE.
  - Typically facilitated by placing the billing file on a GMS SFTP folder for a customer system to grab and ingest in an on-premise billing system.
- ***Availability SLA (default is 99.9%)***
  - Calculated as the allowable amount of "unscheduled downtime" per month of a customer's environment. A 99.9% availability SLA is 43 min and 28 sec of unscheduled down time per month.

RPO and RTO

- **Recovery Point Objective (RPO)**
  - *Maximum amount of allowable data loss*
- **Recovery Time Objective (RTO)**
  - *Maximum amount of time it takes to return the system back to a production ready state*
- **Business Continuity:**
  - *72-hour RPO*
  - *5-business day RTO*
- **Disaster Recovery:**
  - *4-hour RPO*
  - *12-hour RTO*



Business Continuity

Organization's ability to provide essential business functions during and after an incident takes place.

» GMS Hosting and Business Continuity

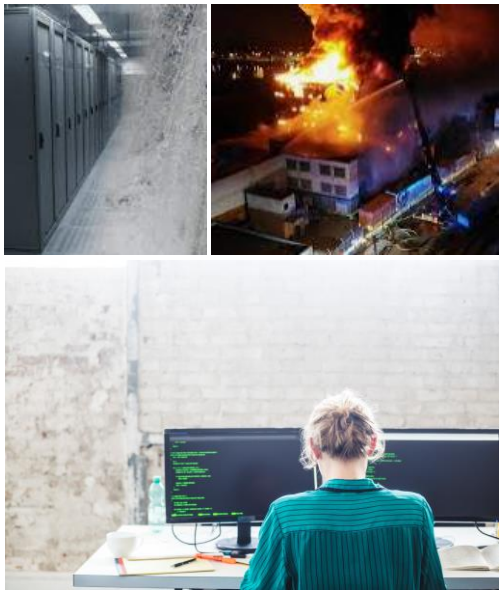
- *Business Continuity is not Disaster Recovery (DR)*
- *Outlines to the customer that Itron is backing up applicable virtual infrastructure, databases, and user data and can confidently restore these within a specified time period*
- *Defined, legitimized, and proven within ISO 27001 and SOC compliancy*
- *Does not provide for the loss of, or loss of connectivity to, an Itron-owned or contracted data center*
- *Provides for RPO of 72 hours and RTO of 5 business days*

An example of Business Continuity would be a corrupt database; the hosted system is not available to the customer and Itron would need to restore the database from onsite or offsite backup within 5 business days.

Per the RPO, the maximum amount of data loss is 72 hours

Disaster Recovery (DR)

DR: Organization's method of regaining access and functionality to the hosted infrastructure after a natural or human disaster.



» GMS Disaster Recovery

- *Optional fee-based service*
- *Business continuance to a customer should a disaster render the data center unavailable or because of a temporary or permanent loss of connectivity to a data center*
- *RPO of 4 hours and RTO of 12 hours*
- *Includes annual failover exercise*
- *Software-based replication. Replication typically occurs every 15 minutes*
- *DR is facilitated by synchronizing the production environment and replicating database failover via Oracle DataGuard or SQL via Zerto*
- *DR is for the production environment only*

Disaster Recovery (DR) cont'd

DR: The organization's method of regaining access and functionality to the hosted infrastructure after a natural disaster or a human disaster.

» **GMS Disaster Recovery**

- *Requires secondary physical data center if the primary production environment is hosted in an Itron-owned or contracted data center*
  - Switch, Las Vegas (primary production data center)
  - Switch, Atlanta (secondary DR data center)
- *When is DR activated?*
  - Data center is lost to a natural (fire, flood, etc..) or human disaster (e.g., security breach or vulnerability)
  - Connectivity to the data center is lost (e.g., cut fiber lines from a backhoe)
  - DR is not activated for a corrupt database...a restore from backup is the solution here