1 NETWORK ARCHITECTURE [L.29.1, M.2.1, C.1.1, C.1.6, C.1.8.6]

The MetTel network architecture meets the mandatory service requirements in SOW paragraph C.1.2. This section presents a technical description of our offering, demonstrating our extensive capabilities in Standards, Connectivity, Technical Capabilities, Features, Interfaces, Performance Metrics, and Security. **Exhibit 1-1** highlights some key strengths

MetTel Strengths **Small Business, Large Reach**
• True facilities-based telecom integrator
• Global reach
• ▇▇▇▇▇▇▇▇▇▇▇▇▇▇▇▇▇
• MetTel EIS Portal—one stop information source including Inventory, Billing, MACD, Procurement, and more
• Award winning customer support

and benefits of our EIS solution in relation to RFP section M.2.1 evaluation criteria.

Exhibit 1-1. Features and Benefits of MetTel Network Architecture

Evaluation Criteria	Features and Benefits of MetTel's Approach
Understanding (M.2.1(1))	• Network architecture meets all requirements for IPVS, ETS, MNS, VPNS and AA. ▇▇▇▇ ▇▇▇▇▇▇▇▇▇▇▇▇▇▇▇▇▇▇▇▇▇ ▇▇▇ ▇▇▇▇▇▇▇▇▇▇▇▇▇▇▇▇ • 20 years of experience as a true facilities-based telecommunications integrator, ▇▇▇ ▇▇▇▇▇▇ ▇▇▇▇▇▇▇▇▇▇▇▇▇▇▇▇▇▇▇▇▇▇▇▇ • MetTel's ▇▇▇▇▇▇▇▇▇ is built with the latest-technology hardware and software configured to be extremely flexible and reliable
Quality of Services (M.2.1(2))	• Network that provides reliable and resilient ▇▇▇▇▇▇▇ ▇▇▇▇▇▇▇▇▇▇ ▇▇▇▇▇▇▇▇▇▇▇▇▇▇▇▇▇ ▇▇▇▇▇▇▇▇▇▇▇▇ ▇ 24x7 live customer support through multiple NOCs and ▇▇▇▇▇▇▇ ▇▇▇ ▇ ▇▇▇▇▇▇▇▇▇▇▇▇▇ ▇ ▇▇▇▇▇▇▇▇▇▇▇▇▇ ▇▇▇▇▇▇
Service Coverage (M.2.1(3))	• Network architecture that provides scalable, expansive reach with comprehensive connection options through ▇▇▇▇▇▇▇ ▇▇▇▇▇▇▇▇▇▇▇▇▇▇▇▇▇▇▇▇ ▇▇▇▇▇▇▇▇▇▇▇ ▇▇▇▇▇▇▇ ▇ ▇▇▇▇▇▇▇▇▇▇▇▇▇▇
Security (M.2.1(4))	▇▇▇▇▇▇▇▇▇▇▇▇▇▇

Evaluation Criteria	Features and Benefits of MetTel's Approach
███████████████ ██████	████████████████████████████████████ • MetTel complies with the security requirements of the Mandatory Service and the designated optional service definitions. • MetTel supports the standards defined for security and ensures Agency-specific requirements are met for identification and authentication, confidentiality, system and resource access control, security audit and logging, data and system integrity, continuity of service, security administration, and non-repudiation. █ ██████████████████████████████ ████████████████████████████ ████████████████████████ ████████████████████████ █████████████████████ • MetTel supports the proper safeguards for handling traffic should failures occur with the ████████████████████████████ █████████

1.1 Understanding [L.29.1(A), M.2.1(1), C.1.8.4]

MetTel provides the Government access to one of the most robust networks available. Even as a

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██████████████████████████ **Exhibit 1-2** shows how the

MetTel Network The Most Comprehensive Reach in the Industry
• Single source, converged, secured networks █ ██████████████████████ ████████████████ █████████████████ • Largest Nationwide Footprint • Dedicated Government Care Team

MetTel network architecture supports the proposed EIS services. The MetTel EIS Portal supports all EIS services, providing Agencies with a single view of all service information. MetTel will make available any future service interoperability ██████ ██████████████ when MetTel offers the interoperability for its commercially provided service.

Exhibit 1-2. MetTel Network Architecture Support by Service

Connectivity and Service Areas

Since inception, the MetTel service philosophy has been to act as a value added strategic partner and single source for all of our customers' telecommunications requirements. As a combined telecommunications integrator and network services provider, we ███

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As an end-to-end Communications Solutions Provider we bring true harmony to the telecommunication service life cycle. Considering the ever-evolving landscape of this industry, where very large companies are being bought and sold at alarming rates and networks are attacked at unprecedented rates, ████████████████████████████████████

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Exhibit 1-3. Telecommunications Synergy

[REDACTED]

[REDACTED]

Several of MetTel's partners are exceptional leaders in their field and as such provide key elements of the MetTel service offering.

[REDACTED]

[REDACTED]

[REDACTED]

Our scale and relationships provide MetTel Government customers with the lowest cost and best coverage across multiple products and solutions, combining the best-of-the-best. MetTel enables Government mission-critical objectives and increases efficiencies to end users. MetTel works closely with all of our partners and providers to design, develop, and install solutions all supported by our award winning customer

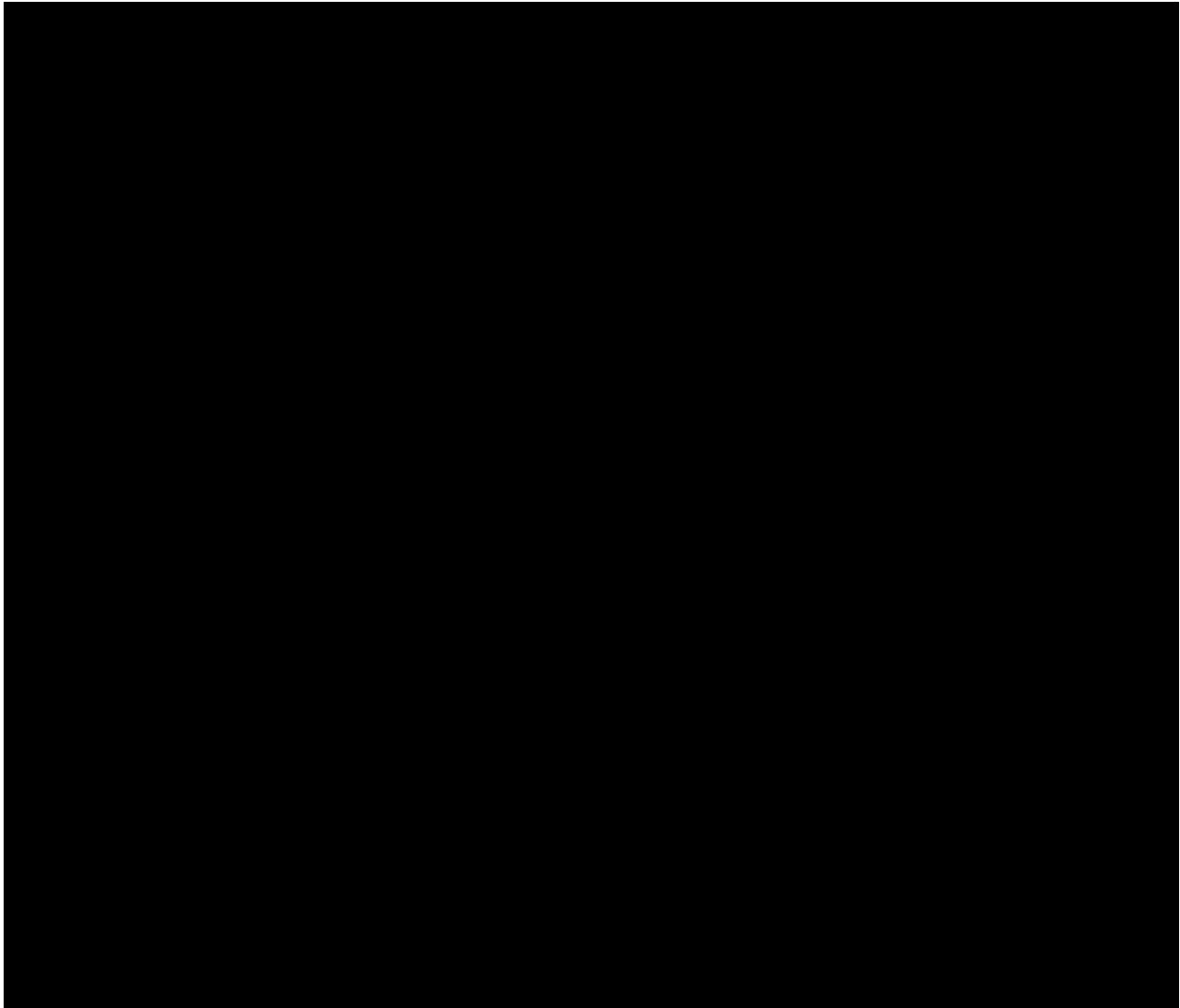service. **Exhibit 1-4** provides a high level overview of the MetTel network architecture.

Exhibit 1-4. MetTel Network Architecture

Point of Presence (POP) Architecture

Use or disclosure of data contained on this page is subject to the restrictions on the title page of this proposal.

Exhibit 1-5. MetTel POP Architecture

Protecting Our Network

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Agency Connections

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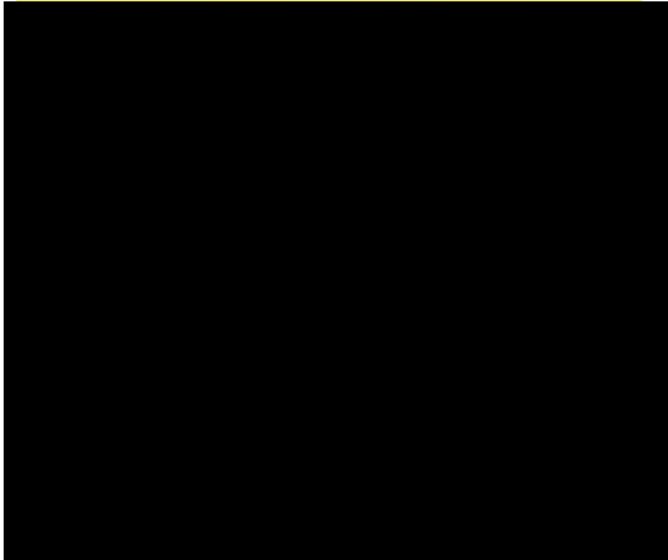
Exhibit 1-6. Customer Dedicated Connection Architecture

MetTel's relationship with LECs, Tier-1 carriers, ISPs, wireless network and cable providers brings the most cost-effective AA to every connection. Having those relationships in place enables us to deliver quickly; ███████████████████

MetTel provides all the mandatory connection options at the Service Delivery Point (SDP). ███████████████████

Partner Networks

Networking has moved beyond single vendor dedicated access. Today, networks must be mobile and flexible to reach users when and where the Agency mission requires. MetTel POPs provide unrivaled connectivity to a abundance of carrier partners

to offer substantial reach and performance from a single provider and management platform. ▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮ provide multi-homed network connectivity. This approach enhances the security and resiliency of the network.
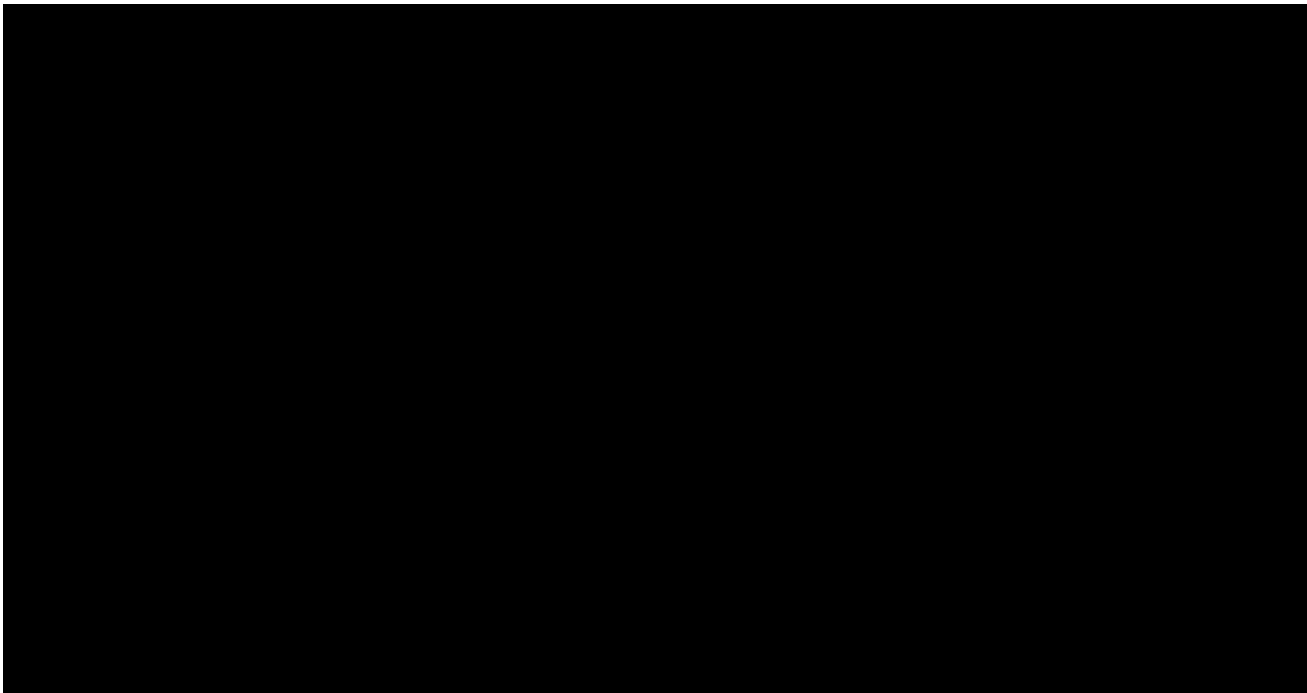
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Exhibit 1-7. MetTel Network Access Architecture

POP Embedded Services Architecture

▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮ to enable superior quality of experience for IP based services, the connectivity between the networks as shown above allows for shortest path access for all agencies. ▮▮▮▮▮▮▮▮▮▮▮▮▮
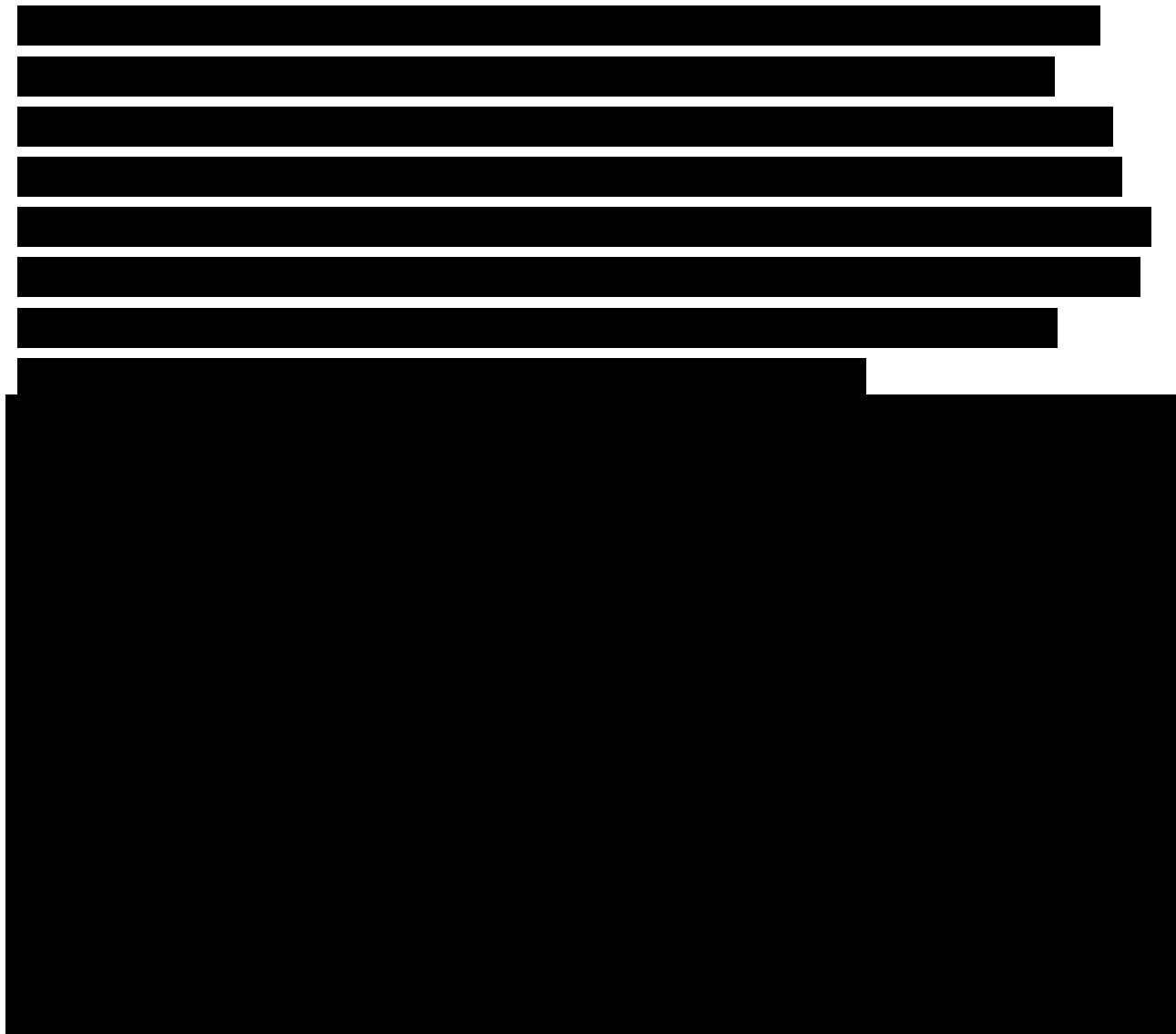
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Exhibit 1-8. Embedded Services Architecture

Service Management Architecture

The MetTel EIS Portal provides a single interface into Billing, Services, Reporting, Ordering, and Help Desk information. ██████████████████████████████████

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██ This latest-technology implementation provides a resilient architecture that scales as the MetTel customer base expands. ██

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████████████████████████████ **Exhibit 1-9** illustrates the logical architectural

overview of the MetTel EIS Portal.
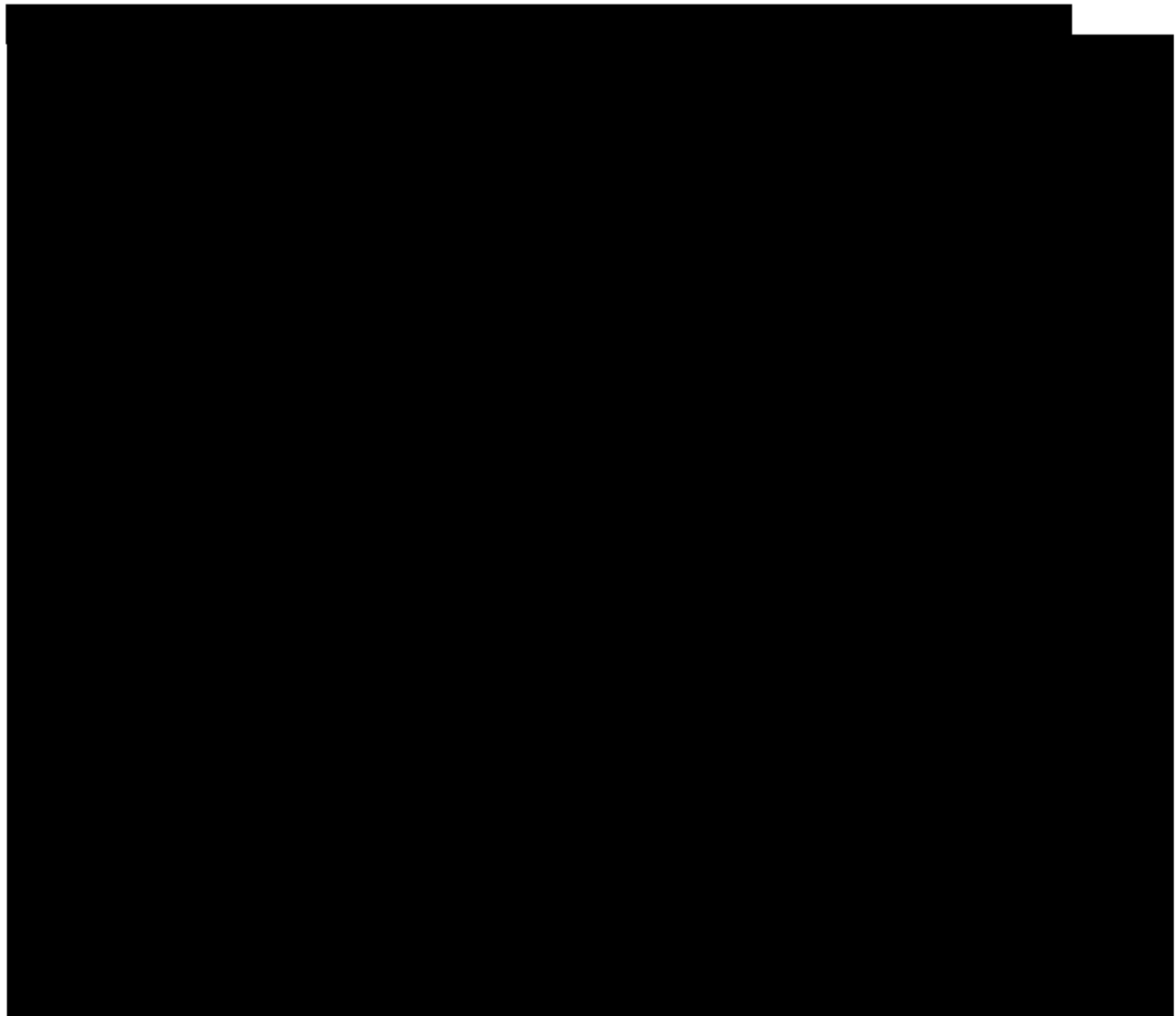
Exhibit 1-9. MetTel EIS Service Management Architecture

Easy-to-understand
and comprehensive views of the Agency
telecommunications spend allow for cost savings from
proper cost allocation and focus on mission

MetTel EIS Portal Key Benefits
- Organized and manageable with automated invoice processing
- Keeps the Agency informed with dashboards, drill down, understandable reports

requirements.

1.1.1 MetTel EIS Portal

The MetTel EIS Portal is central to the MetTel service management architecture.

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██████████████████████████████████ User access is based on user

roles defined by the Agency █████████████

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█████████████████████ Agency access to the

MetTel EIS Portal is established during the on-

boarding process. MetTel and the Agency establish

the proposed implementation plan and escalation

roles and responsibilities. We provide training for

Agency users and administrators. Staff authorized

to order new services or add inventory to an

existing service (i.e., adding phone lines) use the

ordering functions shown in **Exhibit 1-10**.

Program Management

The MetTel EIS Portal supports the Program

Manager and Agency ████████████████

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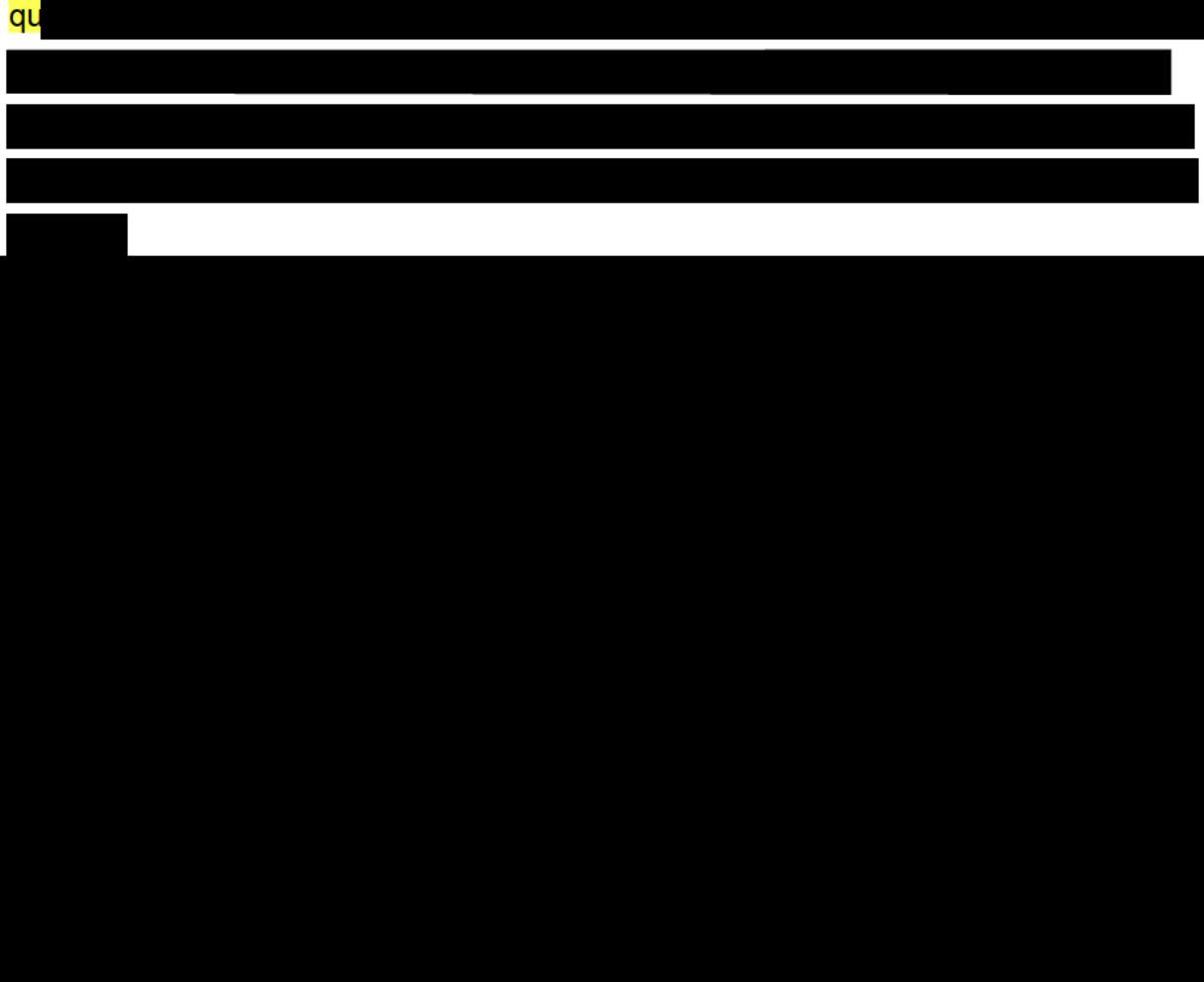██████████████████████████████████████

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Exhibit 1-11. MetTel EIS Portal Inventory Management

Trouble Ticket Management

The MetTel EIS Portal Trouble Ticket Management function supports the Agency and the help desk by creating and accessing Trouble Tickets and monitoring status. Trouble Tickets also track schedules for service installations and service repair, service testing, and billing. Over-the-Air (OTA) help desk provides Agency personnel the ability to open and manage tickets without contacting help desk staff. Real-time network maps with live and historic statistics are available to Agency users based on Agency authorization policy.
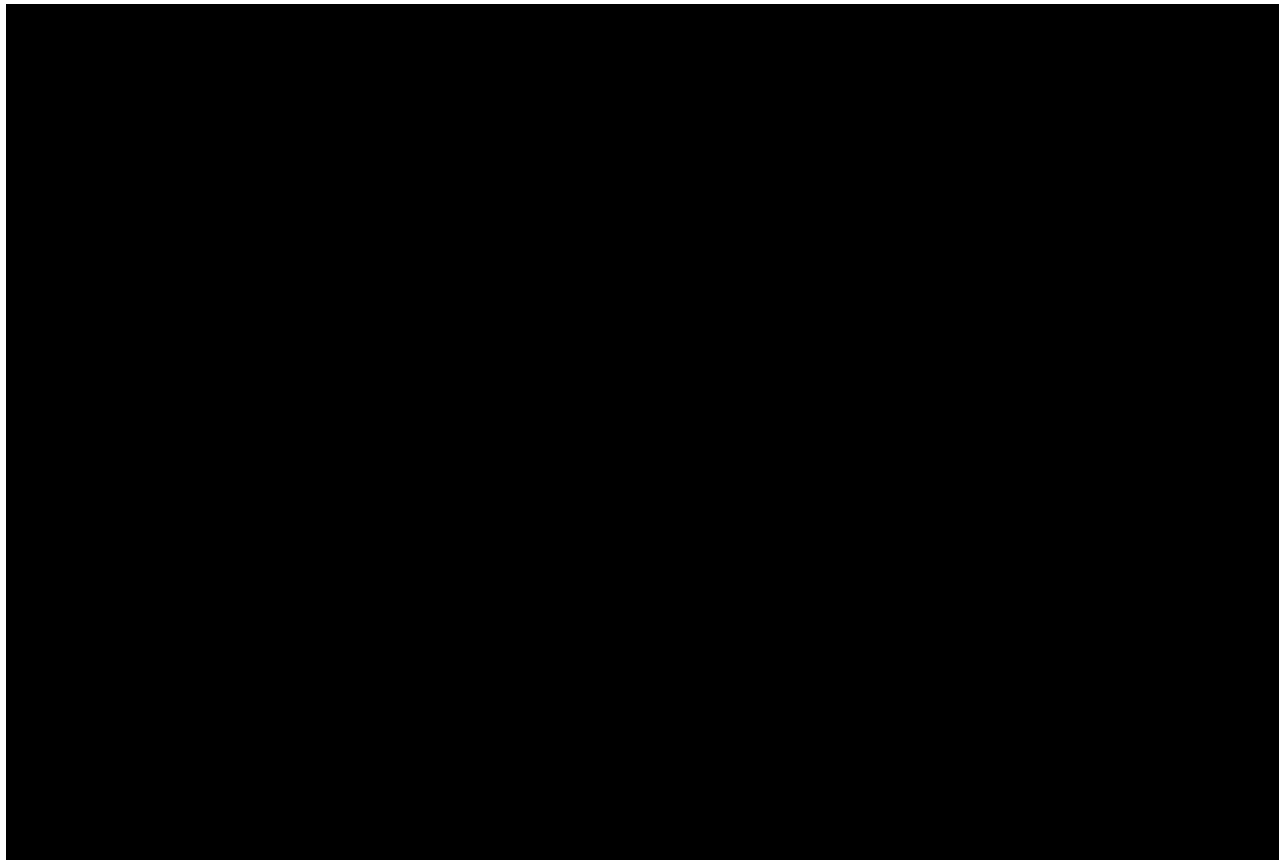
Exhibit 1-12. Trouble Ticket Management

Network Monitoring and Management

This function provides the Agency access to MetTel's real-time monitoring on the MetTel EIS Portal. Agencies have ██████████████████████████████████████ ███ ████████████████████ Users have ██████████████████████████████████ ██ ██ ██████████

Exhibit 1-13. Network Monitoring and Management
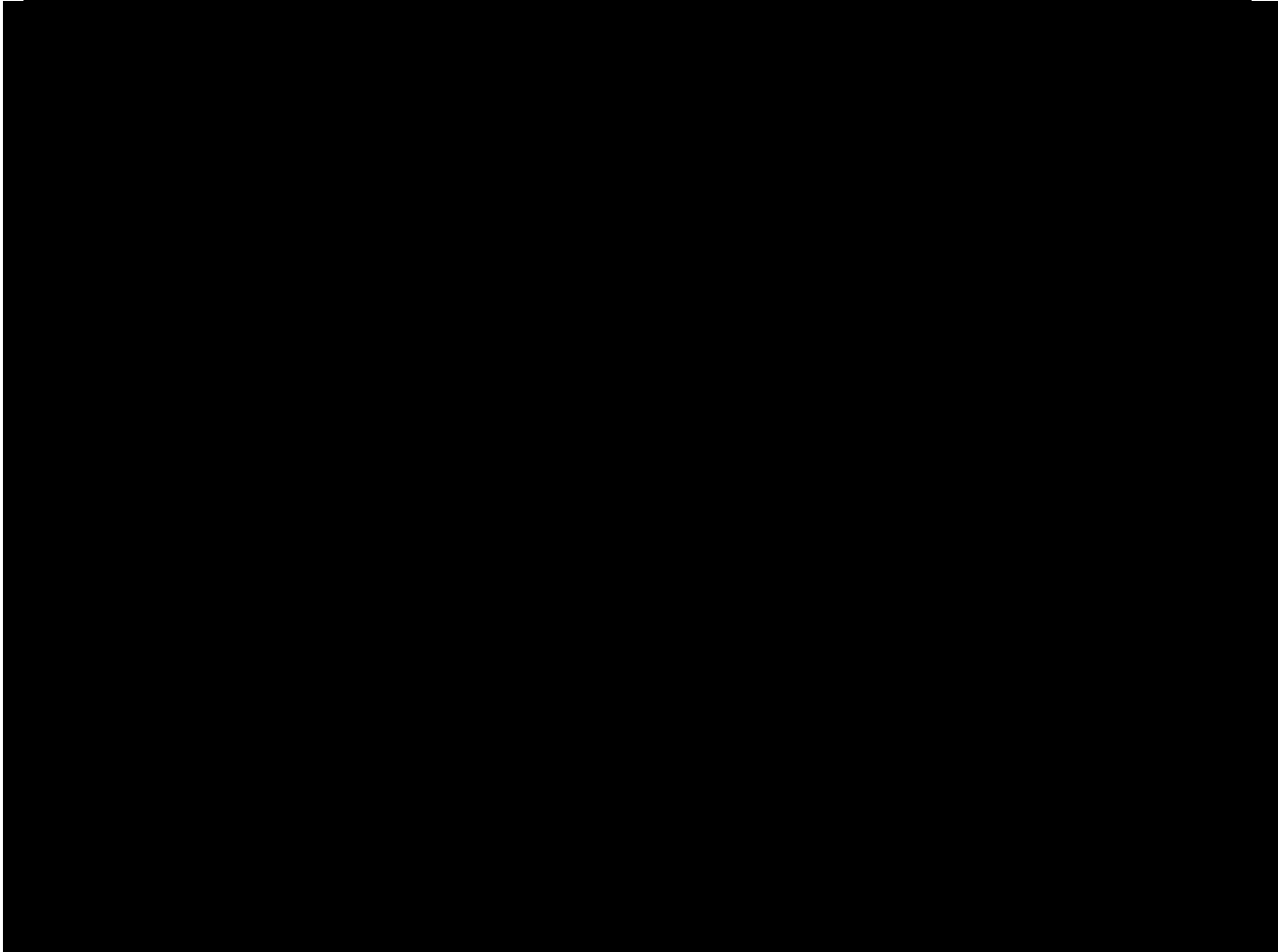
Billing

The MetTel EIS Portal provides a complete consolidation of invoices and interactive analysis of current and historic charges. All bills are available in PDF/print format and EDI using X12 standard formats and other formats as specified by an Agency, ██████ ██ including flat files to allow for streamlined upload to internal systems. MetTel's NCS team partners with the Agency to define the specific elements to be included in the electronic bill and implement the internal accounting structure throughout MetTel's billing system. ████████████████ ██
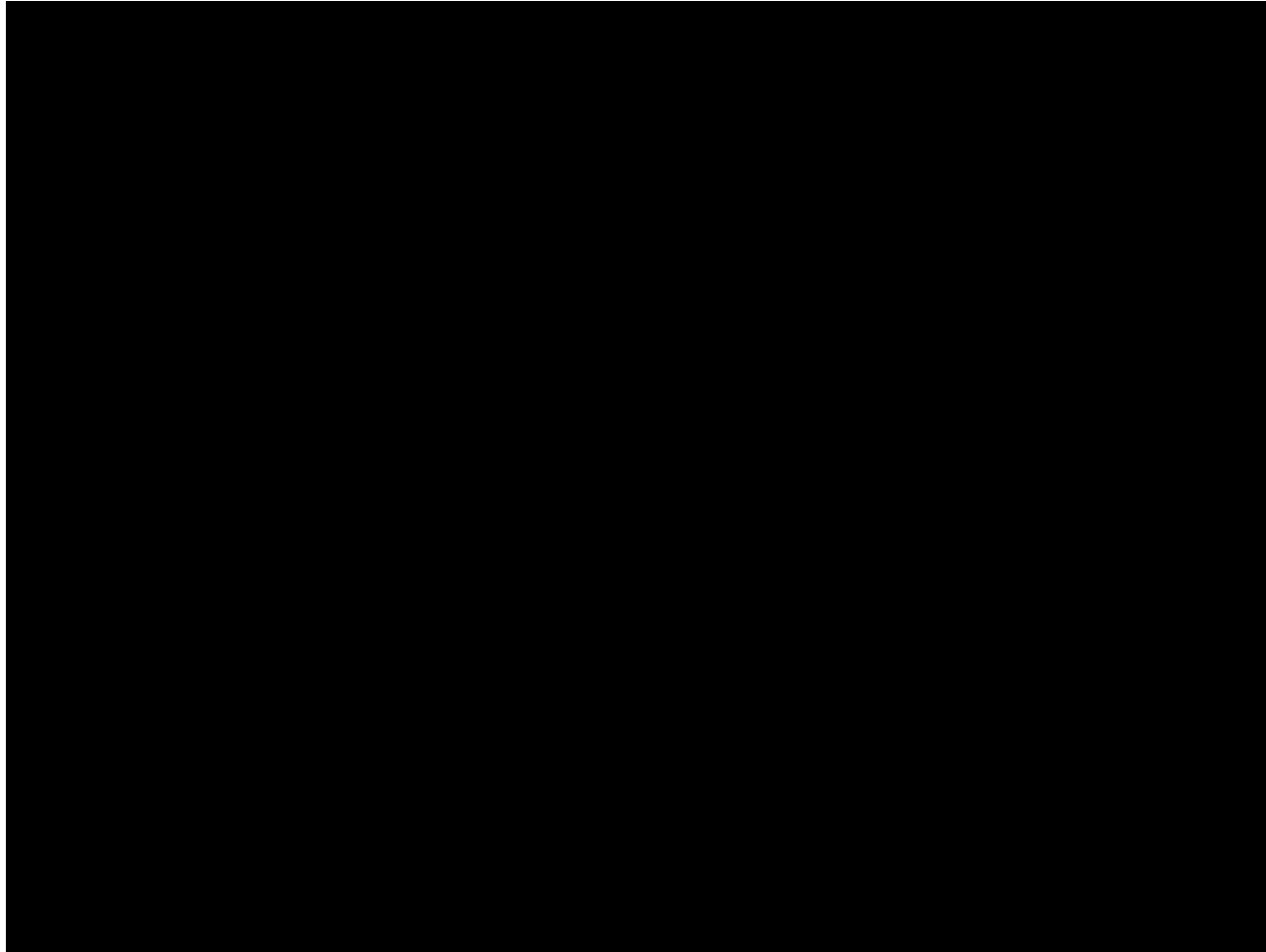
Exhibit 1-14. MetTel EIS Portal Billing Summary

MetTel provides comprehensive, flexible solutions designed to scale with Agency objectives. We have a demonstrated ability to consolidate and control telecommunications expenses for Government Agencies ▉▉▉▉▉▉▉▉▉▉▉ ▉▉▉▉▉▉▉▉▉▉▉▉▉▉ and large commercial organizations ▉▉▉▉▉▉ ▉▉▉▉▉▉▉▉▉▉▉▉▉▉▉. Our engineers and service management specialists provide the network resources and managed services specified in a Task Order and ensure Agency network services are cost-effective, compliant with EIS requirements, and manageable through the MetTel EIS Portal. We guide Agencies through every stage of transition, from mission inception to full operational capability on our industry-leading converged network.

Upgrades and Enhancements

MetTel embraces the evolution of technology to find the most effective and reliable

services for our customers. We were formed in 1996 to provide seamless, multi-carrier telecommunication services to leading commercial and Government organizations. We have effectively and efficiently deployed reliable, resilient traditional voice service to our expanding customer base. As convergence began to evolve in public and private IP networks, ███ ██████ We consider customer privacy and security a top priority and therefore security of our infrastructure and security monitoring are key components of our development. ███ ███

██████████████████████████ The MetTel core network is the foundation for EIS services as well as the extension and deployment of upgrades and enhancements to our products and services.

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██████████████ SD-WAN dramatically simplifies the customer's WAN by delivering virtualized services to branch offices and mobile users everywhere. MetTel leverages enterprise-grade performance, visibility, and control over both Internet and private networks. ███████████████████████████████████

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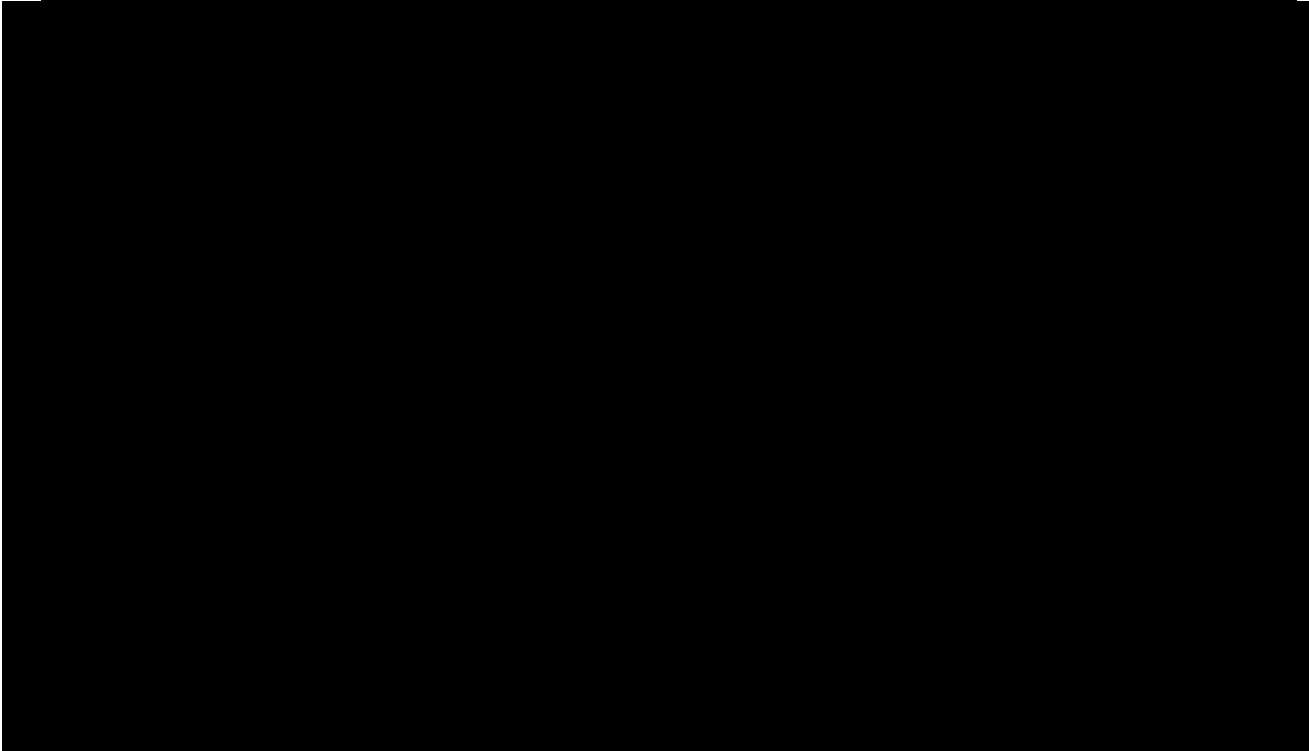
Managed Hybrid WAN

Public, private, and hybrid cloud services, mobility, machine to machine (M2M)
unified communications/ collaboration, the Internet of Things (IoT), digital signage,
ubiquitous Wi-Fi access, and other next-generation workloads require levels of
bandwidth and availability beyond the capacity of legacy enterprise networks. ██████

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MetTel Bonded Internet Service

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MetTel ██████████████████ to better serve Agencies with expanded service. We continue to implement new and leading-technology services that enhance the Agencies experience, provide more effective network and bandwidth management, and provide cost savings and improved bandwidth utilization for our customers.

1.2 Quality of Services [L.29.1 (B), M.2.1 (2), C.1.8.2, C.1.8.3]

The MetTel solution for EIS is built on 20 years of experience as ████████████ ██████████████████████████ in the market. MetTel established strong, sound, seasoned relationships with most of the local, national, and international providers to provide Government users with fully compliant services managed from a single source as well as, scalable, reliable, and resilient EIS services. ████████████

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We provide ███ ████████████. The MetTel network accommodates and optimizes an Agency's

Exhibit 1-17. Example CoS Implementation

applications to ensure accurate and consistent prioritization of traffic across the network. ██

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Based on the agency's specified CoS definitions, the QoS mechanisms use these values to handle traffic in the communication path according to the Agency's defined policy. ██

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1.3 Service Coverage (for CBSA-dependent services) [L.29.1(C), M.2.1 (3), C.1.3, C.1.8.5]

The MetTel Network architecture enables the choice of lowest cost loops and access. ██

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Exhibit 1-18 shows that our services cover ████████████

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Exhibit 1-18. MetTel CBSA Coverage

Exhibit 1-19. MetTel Global Network Reach

1.4   Security L.29.1(D), M.2.1(4)]

█████████████████████████████ provide services and leadership end-to-end in cyber domain expertise, from mobile to cloud, from offense to defense, and from collection to analytics. MetTe█████████████ delivers products, custom solutions, and supporting technologies to address a variety of Cyber missions and needs. ████

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MetTel uses ████████████████████████████████████

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████████████████████████ This starts with policies, procedures, and security awareness campaigns. This is followed by the physical protections of our data centers and corporate offices to protect Agency information and assets as well as MetTel equipment.

The MetTel network protections start at our perimeter with our firewalls (described in further detail below) in fully redundant configurations. These protections deny by default any traffic not permitted on the MetTel network. ███████████████████████

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Policies, Procedures, and Awareness

To protect our infrastructure resources, we developed a comprehensive series of security policies and procedures, ████████████████████████████████

██ Our rigorous awareness and training program ensures our security staff is well equipped to manage today's complicated cyber-threat environment. Regular training and exercise is a mission-critical component of our security methodology.

Physical Defenses

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Internal Network

Like all enterprises, insider threat is the single greatest threat to MetTel's internal network. We counter insider threats by performing enhanced background examinations of our staff members and following the Federal background investigation protocol specified in the GSA EIS RFP. ███████████████████████████

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Servers

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██All unauthorized access attempts are highlighted in the log analysis report and immediately investigated.