Data Center / Server Room

Solutions Guide

Nov 2022

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Crisis becomes Catalyst

The COVID-19 crisis has reversed the relationship between data center management and digital innovation – with rates of tech adoption accelerating to unprecedented levels, the former is now driving the latter, and it is data centers that have to catch up. Despite a 10% decline in worldwide data center infrastructure spending in 2020, all indicators suggest that pandemic-induced digital transformations are now acting as catalysts, with the market set to rebound over the next four years [1].

As increasing penetration of cloud services and the proliferation of IP devices further accelerate market expansion, predictions are that it will be worth US$143.4 billion by 2027. [2]

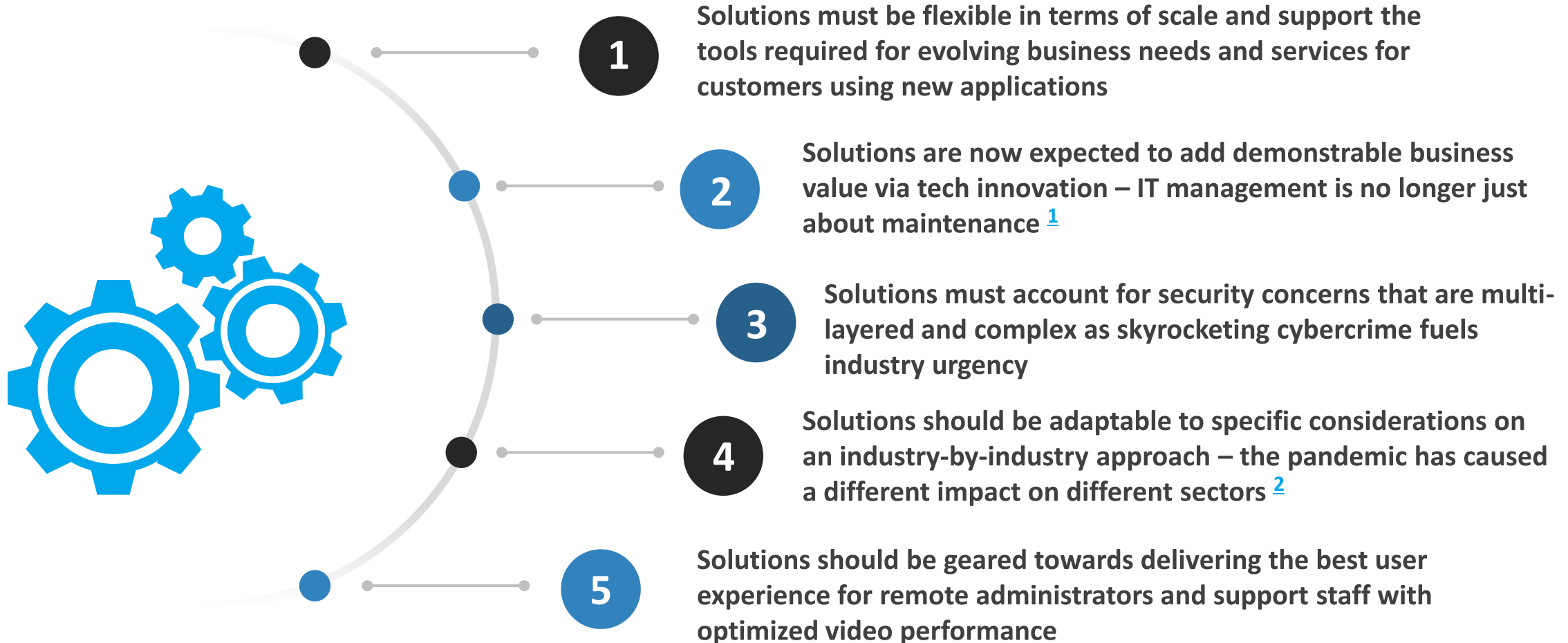**What Do Today's IT Infrastructures Look Like?**

What Do Today's IT Infrastructures Look Like?

The big data explosion increased buying of data center capacity but it has simultaneously forced IT infrastructures to evolve. To support this immense amount of data requires not only a growing number of data centers, but also new kinds of data center builds and new ways to manage them.

Most acutely, infrastructures for IT services are now not only about the data centers themselves – whether its on-premises, colocation, hosting, public and private cloud computing, or edge computing, the industry is transitioning to a variety of hybrid states where data-processing workloads can be deployed from anywhere, and this has far-reaching implications. The size, scale, and the complexity of architectures continue to create a confluence of often-conflicting forces that require new and innovative data management solutions.

Challenges

1 — Solutions must be flexible in terms of scale and support the tools required for evolving business needs and services for customers using new applications

2 — Solutions are now expected to add demonstrable business value via tech innovation – IT management is no longer just about maintenance [1]

3 — Solutions must account for security concerns that are multi-layered and complex as skyrocketing cybercrime fuels industry urgency

4 — Solutions should be adaptable to specific considerations on an industry-by-industry approach – the pandemic has caused a different impact on different sectors [2]

5 — Solutions should be geared towards delivering the best user experience for remote administrators and support staff with optimized video performance

ATEN | Trends

Shift to Cloud-centric Edge for Agility, but Core Remains Viable

By end 2021, IDC expects 80% of enterprises initiate their shift to the cloud twice as fast as before the pandemic. While the benefits of cloud are enterprise agility and less need to invest in IT infrastructure, migrating to the cloud is challenging, especially in terms of I&O skills and cost management. The benefits of core, including control of facilities and the IT environment, remain the same.[1] So while the need to deliver resources to edge locations will spur cloud-centric edge solutions for faster responses, improved resilience, business scaling, and operational flexibility [2], on-premises data centers will remain viable for specialized applications or ones with strict compliance requirements.
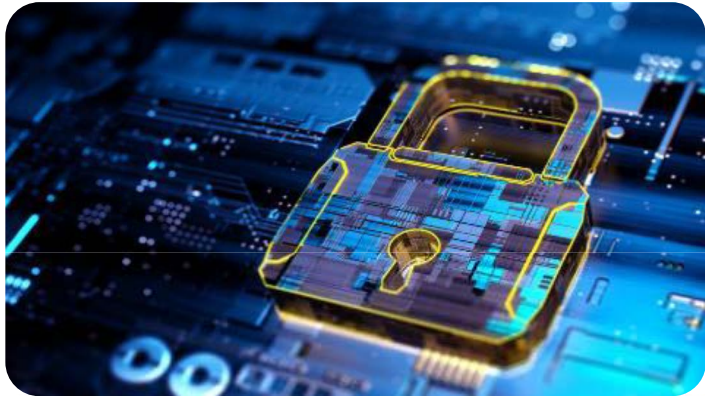
Security Spending on the Rise, Nature of Threats Evolving

Data centers are a prime target for cybercriminals with attacks increasing during the pandemic as remote/hybrid work models exposed network vulnerabilities. Gartner reports that the global data center security market will be valued at US$200 billion by late 2021, a 6% year-over-year increase.[1] Nearly half of data breaches result from human error or system glitches, but new cyber-attacks are more likely to be from actual threat actors. Ransomware, for example, is a growing concern for data center operations as cybercriminals target infrastructure. Businesses need to take precautions to protect data or risk suffering financial and reputational damage, lost intellectual property and even noncompliance fines from industry regulators. [2]

Trends

Mandates for Sustainability as the Greening Game Gets Real

There are many advantages to incorporating green options for optimal data center operations, and demand for sustainable data center solutions continues to soar, spurred by innovations in cooling techniques and automation. As IDC reports, by 2025, 90% of G2000 companies will mandate requirements regarding reusable materials in IT hardware supply chains, carbon neutrality targets for providers' facilities, and lower energy use.[1] Thus, accelerating towards sustainability with green initiatives is something that data center infrastructure providers will need to do. Optimizing data center energy management at the outlet level is also vital to achieving energy efficiency and reducing costs in data centers without harming IT reliability. [2]

Accelerated Shift to Automation, as Advanced AI Robotics Loom

Even before the pandemic, automating processes and routine services for data center management in tandem with remote over IP capabilities was increasing. But now, because of a limited workforce, automation is accelerating beyond firmware updates into advanced processes that ensure seamless operational flow with minimal human intervention. According to IDC, by 2023, all IT and business automation initiatives for extending resource control and analytics are likely to be supported by the emerging cloud ecosystem.[1] Furthermore, as both hyperscale and edge data centers expand, more businesses will deploy robotics and automation to monitor and maintain their data centers for everything from rack rollouts to site monitoring and physical security. [2]

ATEN Solutions

1 **Centralized Remote Access & Control Solutions** to consolidate management of complex IT environments via BIOS-level access and perform real-time updates and maintenance

2 **Flexible Matrix Extension, Access & Control Solutions** to consolidate management of computers across an independent network in a multitude of ways with video wall functionality

3 **Centralized Remote Server + Switch Access & Control Solutions** to consolidate management of complex IT environments with a high degree of platform and serial-based device integration

4 **Centralized Remote Access & Control + Intelligent Power Management Solutions** to consolidate management of complex IT environments while meeting energy efficiency goals
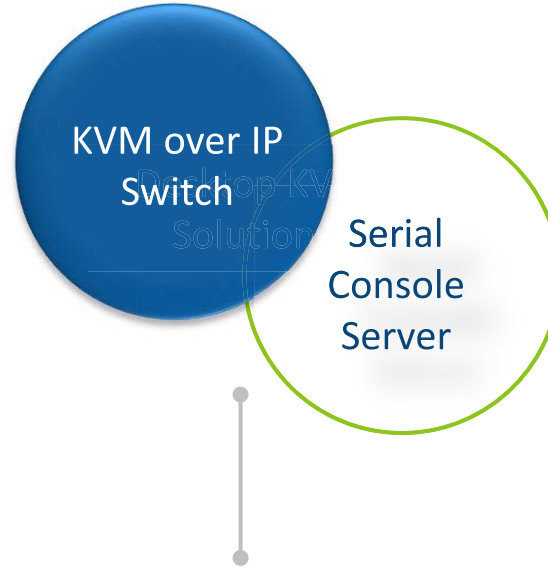
ATEN Solutions

KVM over IP Switch

KVM over IP Matrix System

KVM over IP Switch — Serial Console Server
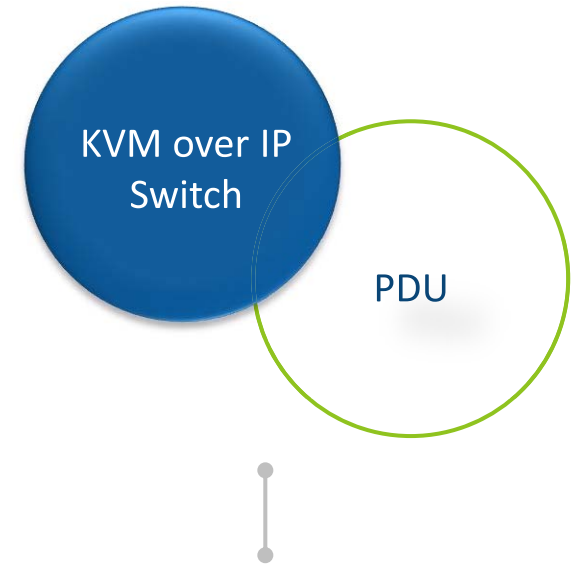
KVM over IP Switch — PDU

1 Centralized Remote Access & Control Solutions

2 Flexible Matrix Extension, Access & Control Solutions

3 Centralized Remote Server + Switch Access & Control Solutions

4 Centralized Remote Access & Control + Intelligent Power Management Solutions

ATEN Advantages

Secure, Centralized Access for Remote IT Infrastructure Management

ATEN over IP solutions provide 24/7 control that eliminates the distance restrictions of data center management, allowing centralized real-time updating and maintenance, enabling a faster response to mission-critical emergencies.

Enhanced Security Features that Prevent Unauthorized Access

Solutions utilize the industry's highest security standards and protocols, including RADIUS, LDAP, LDAPS, secured authentication, data encryption, and network IP/MAC address filter.

New Standards in Resilience to Ensure Rapid Infrastructure Recovery

Tailored to minimize downtime via features that provide robust reliability, ATEN over IP solutions not only support OOB management but also integrate dual power supplies / dual network interface controllers (NIC) to provide backup redundanc.y

Flexible Deployment, Scalability to Increase Business Agility

ATEN's extensive range of over IP hardware coupled with advanced management software, provides flexible solutions that are future-proof, scalable, and implementable across the board to help any business align their data center infrastructure with their strategic needs.

Intuitive, Convenient Control for the Strategic Delivery of IT Services

Making data center management intuitive and convenient, ATEN's CC2000 Centralized Management Software consolidates the management of all devices – servers, switches, PDUs – through a single, tree-view, easy-to-use interface, with a Panel DynaArray™ function.

Commitment to Smart, Green Data Center Power Management

ATEN PDUs allow you to save energy without harming IT reliability. Fully integrable with ATEN's KVM over IP switches and serial consoles as part of a total data center and power management solution. ATEN PDUs are the smart choice for deployment in any data center or server room.

Solutions in Action

1 **Smart Server Management**
Smart Server Management for Digital Transformation of Government Tech Assets

2 **SCADA Server Management**
SCADA Server Management for Streamlining Process Automation, Oil Refinery

3 **OOB Server Management**
Out-of-Band Server Management Solution for 24/7 Online Banking

4 **Remote Server Room Management**
Remote Server Room Management + Intelligent Power Control for Subway System

5 **High Density Server Management**
High Density Server Management for Seamless ICT Service Delivery

6 **Unmanned Server Management**
Flexible Process Control Server Management for Unmanned Facilities

ATEN | Smart Server Management

1 **Smart Server Management for Digital Transformation of Government Tech Assets**

A government ministry responsible for all treasury-related matters required a server management and control room solution for its new building. The finance ministry plays an active role in the promotion and implementation of government policy, so the solution not only needed to be highly secure, but also had to help to revitalize core assets as part of the government's digital transformation strategy. The main server room is located on the 3rd floor, and server management and monitoring capabilities had to be split across two separate government departments in control rooms on different floors.

ATEN | Smart Server Management

Challenges	The ATEN Solution
- Revitalize core technology assets as part of a government imperative to enable strategic change through digital transformation - Need to enhance information security and reduce amount of staff entering the server room - Required video walls for information visualization to be shared across separate floors for data analysis - Must incorporate both CCTV and environment monitoring capabilities	The ATEN over IP server management solution can be accessed and managed via CC2000 software, making it efficient for operators to control servers centrally via a single portal, while also permitting simultaneous monitoring of video output for surveillance, power, and environment monitoring via video walls located in control rooms on both floors. It provides flexibility and installation simplicity along with strengthened data security while critical information visualization and communication capabilities increase work efficiency and productivity. For extra security, user sessions are recorded.

Smart Server Management – Products

KE6900AT
KE6900AR
CC2000 3.0
KN4132VA
KN4164V
CCVSR
KA7170

KE6900AT
DVI-I Single Display KVM over IP
Transmitter

KE6900AR
DVI-I Single Display KVM over IP
Receiver

KN4132VA
1-Local/4-Remote Access 32-Port
Multi-Interface Cat 5 KVM over
IP Switch

KN4164V
1-Local/4-Remote Access 64-Port Multi-
Interface Cat 5 KVM over IP Switch
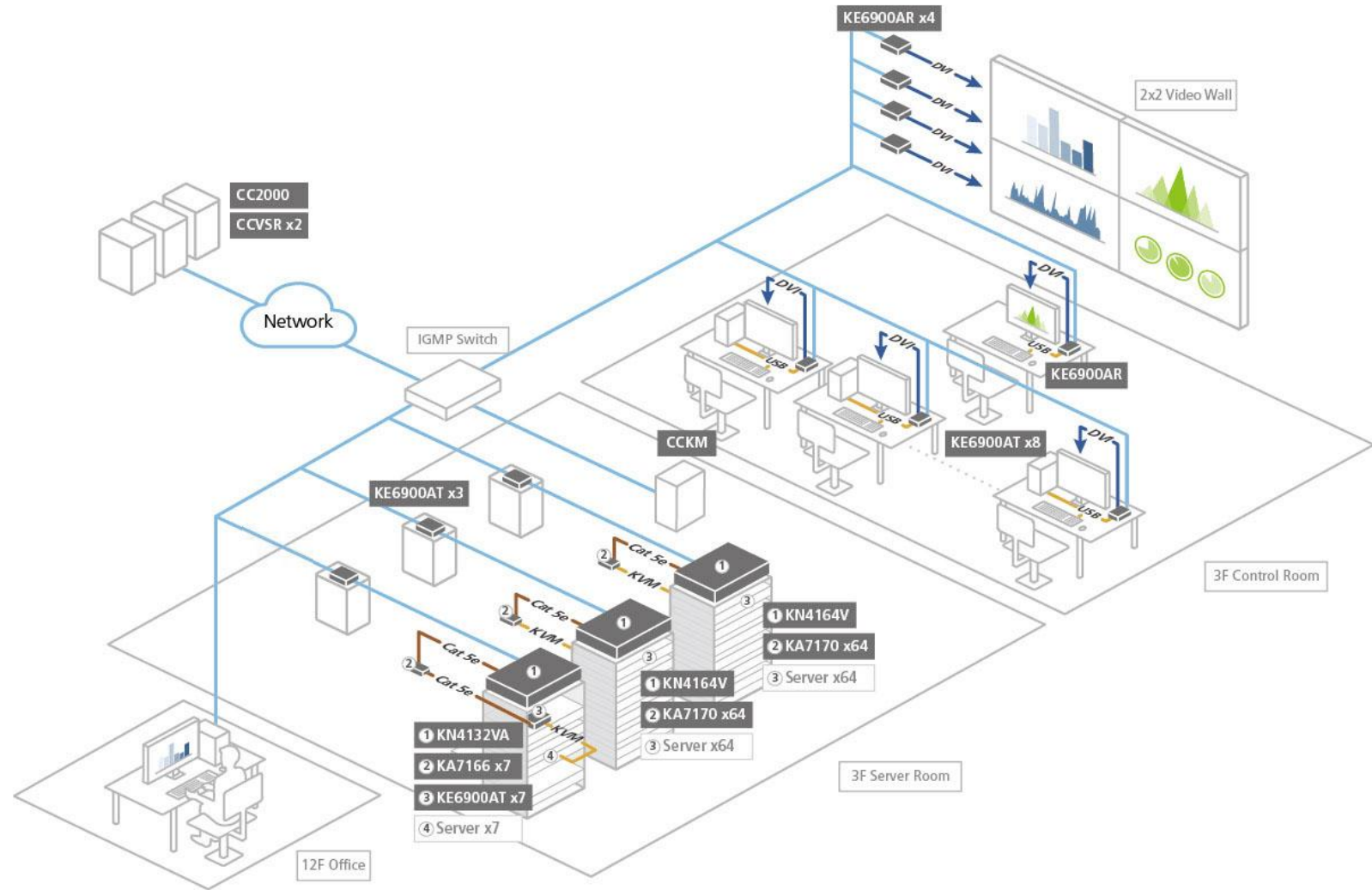
CC2000 3.0
Centralized Management
Software

CCVSR
Video Session Recording
Software

KA7170
USB VGA KVM Adapter with
Composite Video Support

Smart Server Management – Solution Diagram

KE6900AT
KE6900AR
CC2000 3.0
KN4132VA
KN4164V
CCVSR
KA7170

ATEN | SCADA Server Management

2 SCADA Server Management for Streamlining Process Automation, Oil Refinery

A 230,000-barrel-per-day capacity oil refinery needed a solution that allowed operators to control SCADA servers both locally and remotely in order to manage large amounts of information from their process automation systems. The facility has server rooms at four separate sites that, in addition to running various automated processes, also monitor downstream sensor information via long range wireless. The server rooms required local control functionality, but for security reasons, no mobile devices were allowed in the remote site control room, while the solution also had to support FHD, be rack-mountable, and support barcode scanners.
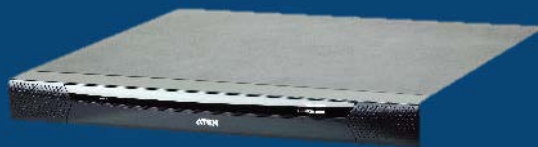
SCADA Server Management

Challenges	The ATEN Solution
■ To enable local and remote monitoring and control of process infrastructure and equipment statuses ■ For security reasons, no PCs or notebooks are allowed in the remote site control room ■ Solution needed to support FHD for accurate information visualization ■ Required a full-featured yet small-size, space-saving solution with low power consumption	The solution allows operators to monitor and control refinery process flows, infrastructure/equipment statuses, and dynamic changes in real-time for better situational awareness and decision making. Dual-view console stations allow for monitoring using Panel Array Mode™ for optimized visualization of the video output from all installed SCADA servers on one screen simultaneously alongside full day-to-day operation on the other screen. Visual clarity is provided by support for HDMI at FHD resolution of 1920 x 1200 @ 60Hz.

SCADA Server Management – Products

ATEN

KA8288
CL3800
VE601R
KA7166
KN4116VA

KA8288
Dual HDMI KVM over IP Console Station

CL3800
Ultra Short Depth Dual Rail WideScreen LCD Console (USB, HDMI / DVI / VGA)

VE601R
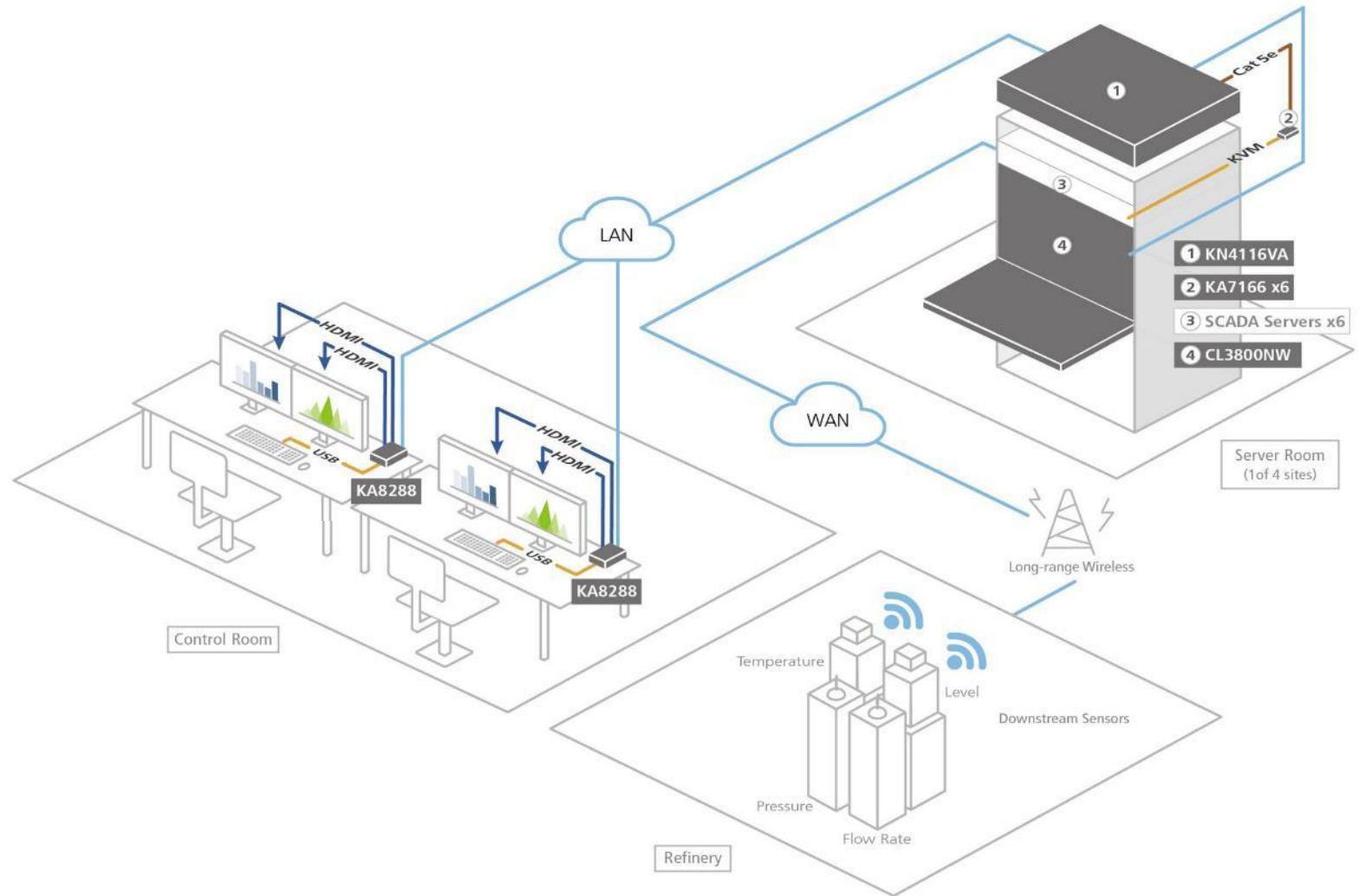DVI HDBaseT-Lite Receiver (1080p@70m) (HDBaseT Class B)

KA7166
USB DVI Virtual Media KVM Adapter with Smart Card Support

KN4116VA
1-Local/4-Remote Access 16-Port Multi-Interface Cat 5 KVM over IP Switch

SCADA Server Management – Solution Diagram

KA8288
CL3800
VE601R
KA7166
KN4116VA

LAN

WAN

Cat 5e

KVM

① KN4116VA
② KA7166 x6
③ SCADA Servers x6
④ CL3800NW

Server Room
(1 of 4 sites)

HDMI
HDMI
USB
KA8288

HDMI
HDMI
USB
KA8288

Control Room

Long-range Wireless

Temperature
Level
Downstream Sensors

Pressure
Flow Rate

Refinery

● Video   ● KVM/USB   ● Network   ● Cat 5e

ATEN | OOB Server Management

3 Out-of-Band Server Management Solution for 24/7 Online Banking

An Internet-only banking service was looking for an upgrade for its out-of-band (OOB) management solution for its server rooms. The bank was already using serial consoles but was looking for newer, improved models for replacement and future expansion. The bank required that the solution not only provided 24/7 availability and access but also security and convenience for their support staff. It was crucial that administrators were appraised with real-time information that provided early detection of fraudulent activity or any problems with processing transactions.

OOB Server Management

| Challenges	The ATEN Solution
■ Required remote access to network devices (RS32) in IDCs and service offices for secure OOB management ■ Dual power supply for redundancy plus remote control in case of emergencies or sudden power outage ■ SNMP (Traps and MIB) for collecting and organizing information of managed devices on IP networks ■ Ability to deploy straight-through RJ45 Ethernet cables to connect to Cisco switches	OOBM provides the means to access the bank's servers if the network is down, providing BIOS-level access and modem access to critical infrastructure outside of the production network, with secure network operation services over an unsecured network with SSH and SSL/TLS support and military-grade encrypted connections. For device status monitoring, automatic event notifications are sent when connected serial devices are offline. The solution supports full deployment without additional costs for rollover cables.

OOB Server Management – Products/ Solution Diagram

SN0132CO

SN0132CO
32-Port Serial Console Server with Dual Power/LAN
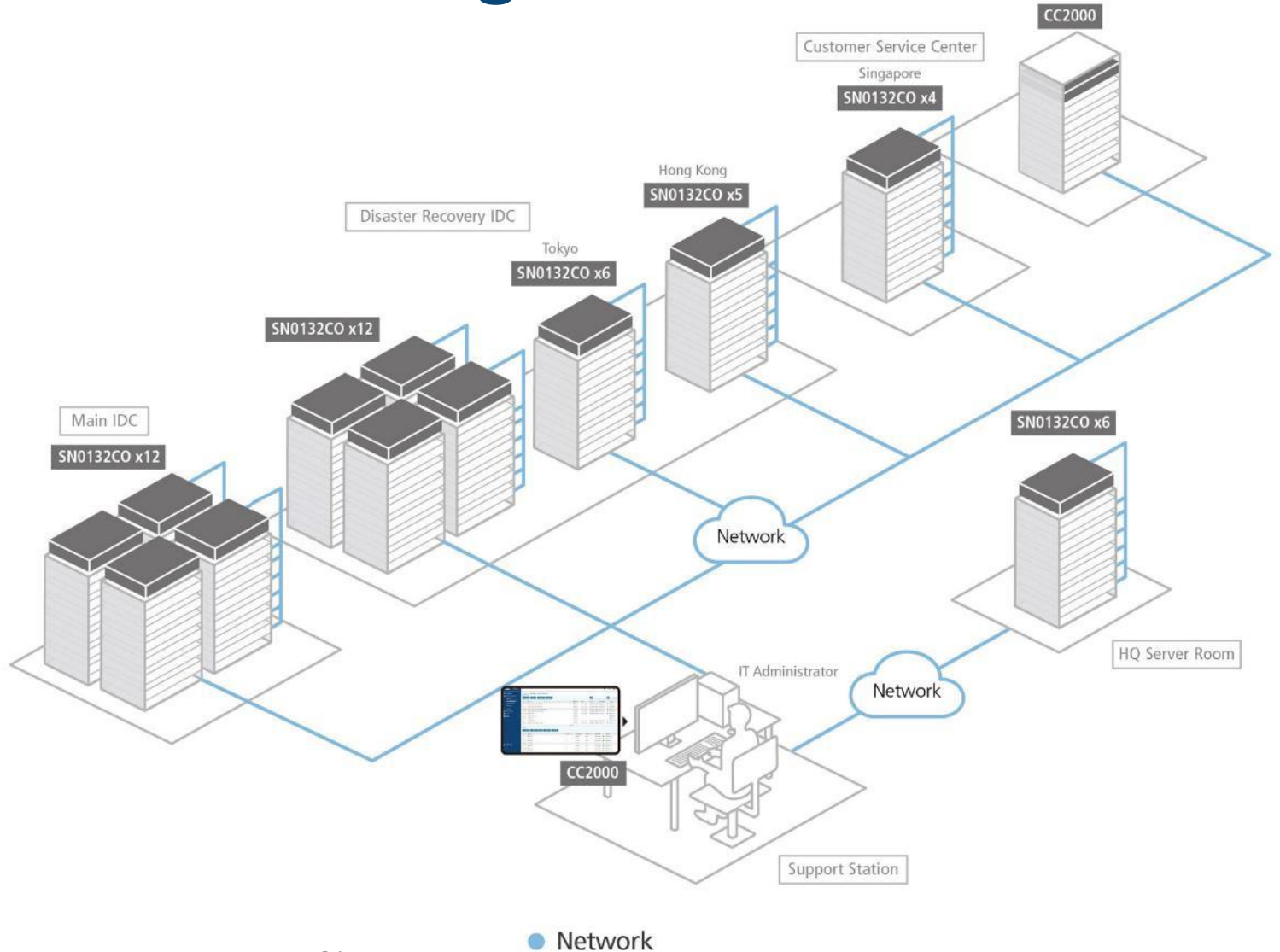
ATEN | Remote Server Room Management

4 Remote Server Room Management + Intelligent Power Control for Subway System

A transportation company runs three metro lines with a combined network of 60 stations. Each station has its own server room and passenger information system that needs to be controlled centrally from a single location. In order to consolidate control of the widely dispersed server rooms, the company was looking for a solution that allows remote management and monitoring of the complete IT infrastructure as well as the ability to remotely manage the power to each of the servers for optimum system maintenance and control.

Remote Server Room Management

Challenges	The ATEN Solution
■ Provide centralized control of servers and information systems in multiple locations ■ IT administrators needed to monitor the video output of multiple servers on one screen ■ Requires Virtual Media support for convenient, centralized updating and maintenance ■ Remotely monitor and manage the power supplied to each server	The over IP solution consolidates centralized management of remote server rooms across a widely distributed, multi-hub transportation network with a high degree of platform and device integration and intelligent power management. The ATEN solution can be access and managed via CC2000, making it flexible and efficient for operators to control through a single portal on a dual-display console. The power management components provide the means to monitor real-time current, voltage, kWh, power consumption and circuit breaker status.

Remote Server Room Management – Products

SN0132CO
OL3000HV
KA8278
KN2116VA
PE8324
CCVSR
CL5800

SN0132CO
32-Port Serial Console Server
with Dual Power/LAN

OL3000HV
Professional Online UPS

KA8278
VGA/HDMI KVM over IP
Console Station

KN2116VA
1-Local/2-Remote Access 16-Port Multi-
Interface Cat 5 KVM over IP Switch

PE8324
30A/32A 24-Outlet Outlet-
Metered & Switched eco PDU

CCVSR
Video Session Recording
Software

CL5800
Dual Rail LCD Console
(PS/2-USB, VGA)

Remote Server Room Management – Solution Diagram

ATEN | High Density Server Management

5 High Density Server Management for Seamless ICT Service Delivery

A major ICT services provider needed to merge its technical and customer service departments. This required the overhaul and upgrade of several data centers, located in 3 different cities. The central maintenance center, in charge of all data centers, needed to manage a large amount of servers simultaneously with a customized over IP management system to help IT managers to automate an array of daily operational processes involved in the provision of a wide range of ICT services as well as take immediate action over IP or on-the-spot in case of irregularities.

High Density Server Management

Challenges	The ATEN Solution
- Remote access to all server parks involved in the provision of ICT services from a centralized location for real-time updating and maintenance - Provide ability to selectively and intuitively monitor attached DisplayPort-interfaced servers - Local access for routine scheduled maintenance and for emergency responses to issues requiring immediate attention - Must adopt best practices for securing networks and customer data, including access control and encryption	The solution offers complete centralized access to critical systems and real-time remote management for the ICT service provider to ensure seamless service delivery. Virtual Media support enables file applications, OS patching, software installation, and diagnostic testing to be accomplished smoothly across the installation from a single console. The KVM switches provide an extra layer of hardware protection for the data center, and are also equipped with extra security measures ensuring compliance with the FIPS-140-2 standards.

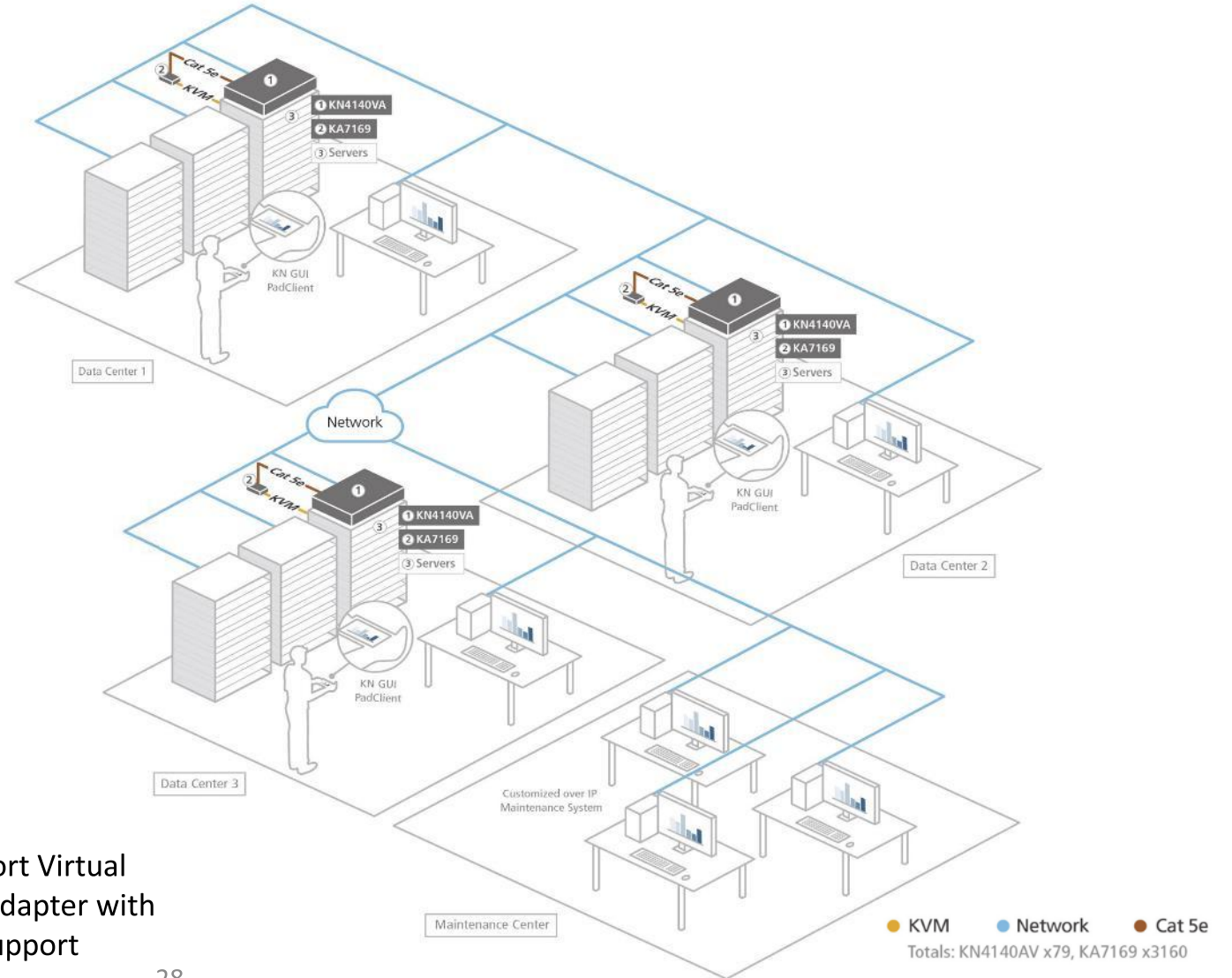# High Density Server Management – Products/ Solution Diagram

KN4140VA
KA7169

KN4140VA
1-Local/4-Remote Access 40-Port Multi-Interface Cat 5 KVM over IP Switch

KA7169
USB DisplayPort Virtual Media KVM Adapter with Smart Card Support

28

ATEN | Unmanned Server Management

6 Flexible Process Control Server Management for Unmanned Facilities

Due to the high cost of personnel, and strict limits to headcount due to safety regulations, an oil drilling platform needed multiple industrial process computers to be safely located in an unmanned server room onshore, while still being accessible from 5 separate control rooms in various locations throughout the production facilities. Furthermore, in case of future operational expansion, the system needed to incorporate both point-to-point and multipoint-to-multipoint KVM extender connections. The setup required a specialist in process automation of industrial plants, with a focus on integrating DCS, SCADA/HMI and PLC solutions with remote IT management.

Unmanned Server Management

Challenges	The ATEN Solution
- To enable constant monitoring of industrial processes via flexible setups of control rooms and remote workstations - Selectively monitor attached process servers efficiently while maintaining high network security - Required remote access for file transfers, OS patching, software installation, and diagnostic testing - Ability to expand maintenance and control operations by adding further surveillance workstations in the future	High connection flexibility means control room operators can access and maintain multiple servers while individual workstations can directly and securely monitor specific servers for targeted process control requirements. Solution provides both single-view and dual-view display workstations for flexible monitoring and operation. Allows secure data transmission with the extra option of isolating individual KE units from the larger network via dedicated LAN port, with virtual media support for all routine maintenance procedures.

Unmanned Server Management – Products

KE6900AT
KE6900AR
CCKM
KE6940

KE6900AT
DVI-I Single Display KVM over IP
Transmitter

KE6900AR
DVI-I Single Display KVM over IP
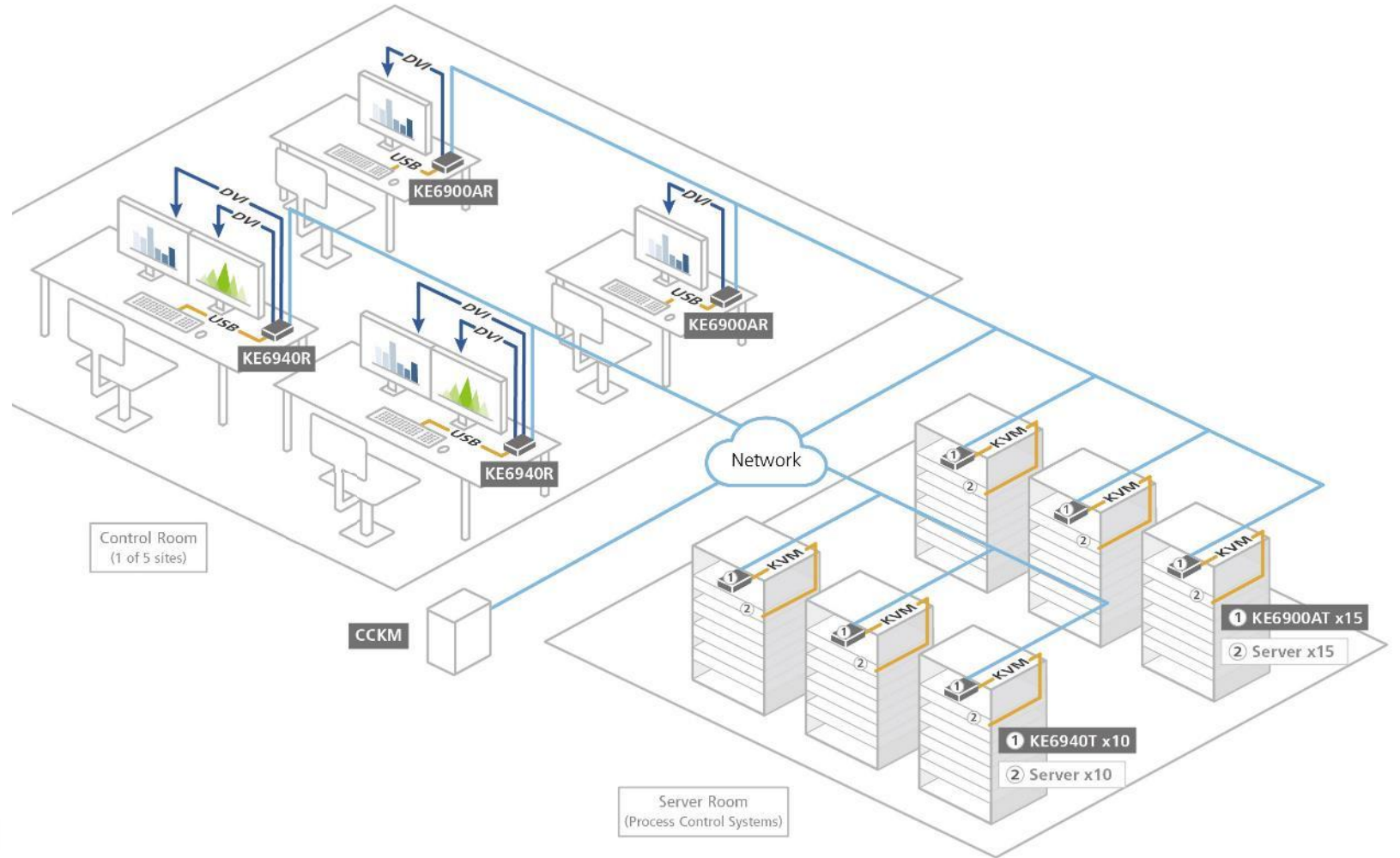Receiver

CCKM
KVM over IP Matrix Manager

KE6940
USB DVI-I Dual Display KVM Over IP
Extender

Unmanned Server Management – Solution Diagram

KE6900AT
KE6900AR
CCKM
KE6940

Simply Better Connections