



Corporate and Product Backgrounder

Corporate History

A Tradition of Growth

Today's business environments are driven by ever more complex technology and rely increasingly on multifaceted networks to support their customers. Enterprise and service providers are realizing the strategic role network and Web site management play in their pursuit of the best performance at the lowest cost. These elements, in combination with IT virtualization initiatives, are enabling IT to reduce the Total Cost of Ownership (TCO) for their end users.

Since 1991, AES has been providing innovative solutions to solve the challenges of managing these technologies, as well as providing the superior reporting capabilities mandated by compliance to more stringent business controls. The AES family of performance and availability solutions has continuously evolved to encompass the changing demands of Fortune 1000 customers and new technologies with expert analysis. While the company began with a focus on mainframe network performance monitoring solutions, AES now leads the domain of mainframe and open network service and performance monitoring. In keeping with a tradition of customer-driven development, AES added solutions to analyze the performance of open system servers, addressing the growing needs of global businesses. A new generation of security products provide businesses of all sizes and the channel partners the flexibility to enhance their infrastructure security protection with a proven solution set. AES continues its history of leading edge development, now offering solutions for Business Cloud Service, Docker Management, and Security Management.

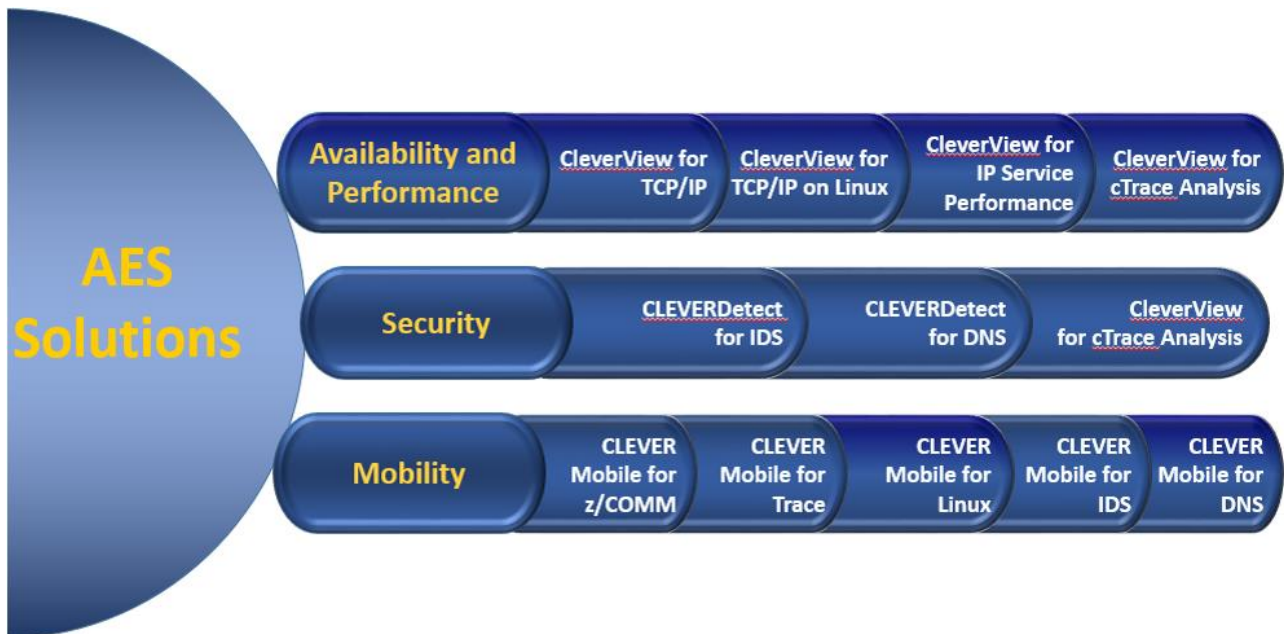
Infrastructure convergence has been accelerated by the rise of cloud computing and by IBM[®]'s announcements of new and evolutionary z System hardware and Linux support. By using the z System, corporations are able to focus on consolidation and virtualization especially for those environments where Linux has become the operating system of choice. The z System allows these multi-architecture data centers to effectively manage their cross-platform environments, ensuring security and availability for their CPU-intensive applications, and AES uniquely provides full support for these environments.

Additional infrastructure convergence has occurred in the DNS (Domain Name Server) arena with heightened focus on ensuring the security and reliability of these systems. The impact of unauthorized changes on DNS servers can have devastating and costly impact on a business. AES has superior products in this area.

AES Today

AES is located in Palo Alto, California, U.S.A. in the heart of Silicon Valley where innovation meets hard work. We are a stone's throw away from Facebook, LinkedIn, Google and Apple Computer campuses. Please access www.aesclever.com for detailed information of our corporation.

AES CLEVER[®] Solutions provide *intelligent views into the world of business cloud service and security management*. CLEVER Solutions are a comprehensive set of Business Service and Security Management solutions providing monitoring, performance, deep dive diagnosis, and infrastructure security management features that extend traditional management capabilities. CLEVER Solutions ensure the availability of critical business systems, provide the means to rapidly resolve problems, and expand insight into potential security threats.



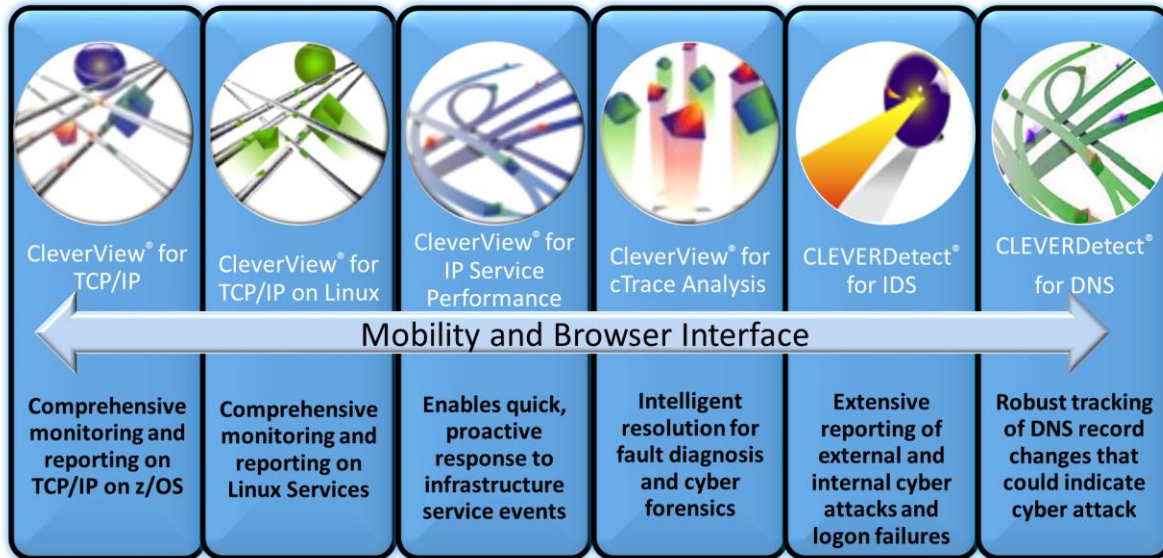
CleverView[®] family of enterprise class service management applications providing performance, availability, and deep dive diagnostic capability to enterprise knowledge workers.

CLEVER Mobile[®] Advantage applications for powering IT service deliveries and security with support for key mobile operating systems iOS[™], Android[™], and limited BlackBerry[®] providing anytime, anywhere global access.

CLEVERDetect[®] family of enterprise class security applications provide businesses of all sizes and channel partners the flexibility to enhance their infrastructure security protection with a proven solution set.

Product History

The AES CLEVER® Solutions Family - An Overview



CleverView® for TCP/IP

CleverView for TCP/IP helps performance analysts, operations personnel, system programmers, knowledge analysts, and capacity planners effectively monitor performance and availability. Its superior monitoring makes it the ultimate choice for large IBM-hosted data centers with Enterprise Extender, TN3270, FTP, WebSphere®, and/or other integral Business Services. It uniquely provides comprehensive Service Level Reporting, continuously measuring Service Level performance for thousands of IP-critical resources in real time including pre-defined critical resources, V T A M , CSM, applications, servers, clients, and TCP/IP connections. CleverView for TCP/IP also facilitates simplified real-time z/OS packet tracing. CleverView for TCP/IP provides:

- Customizable and comprehensive real-time, near-time, and historical views of z/OS TCP/IP performance, removing the need for additional reporting tools or learning new scripting languages
- Intelligent alert generation in a central display (SysPoint)
- Comprehensive FTP data
- Easy integration into current environments
- Minimized overhead, avoiding requirements for continuous trace data collection and/or gathering redundant z/OS MIB data
- Support of Ethernet traffic monitoring from z/OS, z/VM® and Linux on System z® with OSAENTA trace support
- FTP logon failure analysis supporting an enterprise security strategy
- z/Comm facility improves operator effectiveness with expert command enhancements, event manager action, and advanced grouping functions
- Real-time, near-real-time, and historical reporting on collected metrics including service level batch reporting
- Enhanced interval performance record collection capabilities with the cutting of SMF records
- Integration with advanced reporting tools like MXG and MICs.
- State-of-the-art web technology deployed in existing WebSphere Application Servers or open-



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source Apache servers requiring no client code or additional hardware or software, and eliminating potential security risks inherent with proprietary architectures

- Anywhere, anytime support with CLEVER Mobile for z/COMM.

With **CLEVER Mobile for z/COMM** option implemented, mobile access to monitored metrics provided by SysPoint Dashboard, Thru24 Alerts, LinkView, Connect Expert, and z/OS system messages is essential to keeping a z/OS environment running at peak performance. The real power lies in the ability of **CLEVER Mobile for z/COMM** to allow z/OS system-wide system message monitoring, alert notification, z/OS® and TSO command submission, and CLIST and REXX script execution from the mobile device. Messages can be filtered based on monitoring by groups such as VTAM, Enterprise Extender, Intrusion Detection Service, Communication Server, FTP, MQSeries® and more. The app is available for Android, iOS, and BlackBerry. The powerful alert and command capability with classification is standard on all products in the CLEVER Mobile Advantage family.

CleverView® for TCP/IP on Linux

CleverView for TCP/IP on Linux supports the virtualization migration effort for the zEnterprise System. It monitors Linux resources to determine their availability, performance supporting a defined Service Level Agreement (SLA), and effective utilization. CleverView for TCP/IP on Linux ensures that the zEnterprise System creates the promised unification and robust IT infrastructure as advertised, resulting in:

- Dashboard provide centralized, customizable overview of activity providing users the insight needed to make performance improvements using either a dashboard or text report views.
- BlockChainView provides ledger insight allowing tracking of ledger transactions and peer network status.
- ClusterView aggregates Linux/UNIX hosts providing crisp and clear consolidation of metrics allowing trend, pattern, and anomaly identification.
- DockerView tracks key metrics and events resulting in visibility into the performance of the applications inside your container and enabling detection of anomalies in the container behavior, microservices and resource bottlenecks.
- LinkView shows the traffic and status of links associated allowing quick response to any slowdowns in information movement.
- ProcessView maintains real-time resource utilization for Linux processes resulting in impact identification of Linux systems issues.
- Connect Expert checks ports and connectivity to all sessions running over TCP/IP in real-time, as well as showing real-time UDP data yielding details on connection failures.
- PinPoint, with its user-friendly tabular menu, provides a quick, easy way to zoom in on a specific resource or activity providing additional details leading to problem resolution.
- OSA-Express Monitoring analyzes extensive metrics on Ethernet Adapter throughput, LPAR throughput, and overall adapter utilization which provides a dynamic health-check of OSA-Express.
- The Alert reports alarm users with diagnostic information on the performance and availability of Links, Ports, Processes, Critical Resources, and Protocols allowing immediate response to major problems.
- Snapshot Thru24 reports show near-time IP throughput data for Links, Processes, Ports, and Critical Resources exposing near-real time changes in monitored resources.
- Historical Thru99 reporting allows the user to monitor IP workload and customer SLAs, to track response times historically, and to investigate specific performance issues.
- Commands with security options provide the diagnostic power needed to easily diagnose potential problems and resolve them quickly.
- CLEVER Mobile for Linux app is an optional feature providing access to CleverView for TCP/IP on Linux from a mobile device.
- SMF Host Utility integrates Linux monitored metrics with z/OS SMF records expanding enterprise insight into performance and availability.
- Alert Notification Report summarizes alert information based on alert initiation and alert clear functions providing clear and concise information to the enterprise knowledge worker.



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- KVMView providing state, CPU count, memory used, max memory, and CPU used along with the ability to drill down into the TCP/IP statistics for the KVM selected.

CLEVER Mobile® for Linux empowers IT staff members to provide exceptional service to the business with their iOS®, Android®, and BlackBerry® powered mobile devices. The added access capability ensures real-time notification of problems leading to increased Linux and UNIX service availability, regardless of the hardware platform on which Linux or UNIX resides – open systems or System z. Historical information access through these mobile devices improves management of service level objectives globally.

CleverView for TCP/IP on Linux is the solution that improves the agility, reliability and performance of virtualization – the foundation for datacenter consolidation initiatives.

CleverView® for cTrace Analysis

CleverView for cTrace Analysis provides expert analysis in network problem diagnostics. It is an unsurpassed utility for network technicians, drastically reducing time-consuming, tedious analysis and making inroads into TCP/IP problem solving. CleverView for cTrace Analysis provides knowledge workers with the capability to bring analyses back under their own control, saving both time and money in resolving otherwise complex problems.

CleverView for cTrace Analysis provides both trace generation and trace analysis support. Analysis can be accomplished even if the trace was generated with another tool. Which allows the knowledge worker the ability to analyze traces collected from mobile to mainframe to open systems. In addition, traces provided can be compared side-by-side providing quick resolution of TCP/IP problems between systems.

- Multi-architecture trace generation for z/OS®, OSAENTA, HiperSockets®, Windows®, Linux, Linux on System z, AIX®, UNIX, Android®, iOS®, and more
- Mobile to mainframe trace support
- Multi-architecture import and analysis for any trace generated with CleverView for cTrace Analysis, Sniffer, or any trace file with a .cap or .pcap extension
- IPv4 and IPv6 protocol support including IPv6 tunnel decoding
- Protocol decoding including Enterprise Extender, FTP, TN3270, IPv4, TCP, OSAENTA, and NetBIOS to name a few
- Auto-scheduling of packet capture
- Pinpoints performance issues by providing host time/network time breakout
- Simultaneous interval based tracing
- Side-by-side trace comparison with TraceDiff for faster problem resolution
- QueryBuilder filters captured data allowing focus on specific items under investigation
- Critical session reports with response times and transfer rates
- Split screen display provides both summary and detailed information on a single screen
- Protocol summary provides high level overview of captured detail
- Packet discard/port tracing available
- System level credentials required
- SU command capability for Linux/UNIX/AIX tracing
- Data trace reveals application level inconsistencies before encryption or after decryption
- Capture and analyze both OSA and HiperSocket IP packet diagnosis
- Real-time packet trace using z/OS API
- Capture multiple LPAR packet traces through the OSA interface from one z/OS system

CLEVER Mobile® for Trace is an app that allows the capture of IP packet traces on Android and iOS mobile devices. As mobile devices are accepted as standard end user devices in enterprise businesses, the need to ensure deep dive diagnostic problem resolution to those devices is needed. The ability to start



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and stop traces with defined filters is the core function of the mobile app. The send function allows the transfer of the captured trace to the base product CleverView for cTrace Analysis for detailed analysis. With CleverView for cTrace Analysis Expert Analysis functions the ability of enterprise knowledge workers to be able to diagnose mobile performance bottlenecks, mobile application issues, and mobile device availability problems from development through deployment will reduce costs and improve problem resolution.

CLEVERDetect® for IDS

CLEVERDetect for IDS is a z/OS Intrusion Detection tool providing a new way to view IDS messages, route these messages to SNMP or SIEM managers, view FTP server logon failures, and issue commands from either a browser or mobile interface. The ability to provide enterprise wide z/OS intrusion details and FTP Logon failures in a crisp, clear, and concise environment allows trend, pattern and anomaly identification. The resulting details provide for more effective decision-making to meet today's dynamic anywhere anytime security environment.

- z/OS IDS message capture and transfer providing immediate insight into malicious activities or policy violations.
- Mobile and browser interfaces ensures real-time notification of problems leading to increased Intrusion Detection Service (IDS) activity visibility.
- Strengthen z/OS security for File Transfer Program (FTP) with online FTP session logon failure in real-time and through historical reports.
- Improve operator effectiveness with integrated Command functions allowing deeper inspection into potential problems.
- Interrogate TCP and UDP protocol for IDS attack detection including malformed packets, violation of outbound RAW restrictions, UDP perpetual echo, and restrictions placed on IPv4, IPv6, ICMP and IP fragments.
- Transfer IDS messages and FTP Logon Failures as SNMP traps or syslog messages to Security Information and Event Manager (SIEM) and as notifications to mobile devices.

CLEVER Mobile® for IDS empowers IT staff members to provide exceptional service to the business with their iOS® and Android® devices. The added access capability ensures real-time notification of intrusions leading to increased visibility into potential security breaches. The resulting details provide for more effective decision-making to meet today's dynamic anywhere anytime security environment.

CLEVERDetect® for DNS

CLEVERDetect for DNS is designed to help DNS administrators, infrastructure analysts, operations personnel, security analysts, and enterprise knowledge workers effectively understand changes in DNS records entries. Table and cache poisoning is one of the most important hacking activities to understand immediately to prevent impact to the business

- DNS Diff exposes changes in DNS records which could be due to malicious activity
- Web Browser and Mobile app provide enhanced mobility to DNS record changes
- Ensures real-time notification of DNS record changes to the appropriate IT knowledge worker with structured alert levels and alert notification reports
- Identifies who will receive specific alert details for decision making with the user authorization level function
- Rearm capability avoids flooding mobile device with repetitive alerts
- Audit report displays historical details on when a DNS record was different from the baseline
- Commands provides access to common TCP/IP functions like Ping and Traceroute to aid in forensic diagnosis



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- Assists in the detection of table and cache poisoning, amplification, and redirection vulnerabilities
- DNS Monitor shows real-time changes in DNS records compared to a baseline with customized interval recording

CLEVER Mobile® for DNS empowers IT staff members to provide exceptional service to the business with their iOS® and Android® powered mobile devices. The added access capability ensures real-time notification of changes in DNS records leading to increased awareness of potential security vulnerabilities. Historical information access through these mobile devices improves forensics management of security threats globally.

CleverView® for IP Service Performance

CleverView for IP Service Performance supports critical IP service monitoring for zSeries® (z/OS and z/VM) and Open Systems (Linux, Unix) running in day-to-day VM operations. It provides for monitoring of cloud computing service levels and visibility into the performance and availability of:

- **Infrastructure Services:** DHCP servers, DNS servers, and Routers
- **Application Services:** high-demand Internet services, such as FTP, Telnet, and IP-addressable Business Application Services on virtual servers.
- **Business Services:** critical business groups (by IP-addressable devices in the network)

CleverView for IP Service Performance groups the available data logically into these classifications identified by their major business functions. It provides the ability to measure adherence to user-defined service level agreements within these groupings, and also provides real-time alerts and historical trends.

Within the Infrastructure Services Group, the three interrelated functions that ensure IP management's visibility are DHCP servers, DNS servers, and Routers:

- DHCP* monitors the performance of VitalQIP® servers ensuring that users can obtain IP addresses as needed
- DNS monitors the DNS servers ensuring that address-to-name and name-to-address lookups are operational and efficient
- Used in conjunction with DHCP and DNS services, Routers ensure the performance of routing infrastructure is adequate

**Note: The AES solution provides significant cost savings by supplying address management statistics enabling the user to decide an optimum subscription level for QIP.*

The Application Services Group, with the increasing use of virtual servers running Linux systems, requires ongoing monitoring and historical reporting of the availability and performance of specific IP services:

- FTP monitors the ability to transfer files between locations
- Telnet monitors the ability to log in to remote servers
- PortMon monitors the accessibility of remote/local TCP ports to mission critical applications

The Business Services Group needs performance, availability, and service level monitoring for any critical (IP-addressable) business group on your network. Monitoring can be implemented by departments or by device type, e.g. ATMs, copiers, printers, engineering, or sales.

CLEVER® Decoder

CLEVER Decoder expedites VTAM®/NCP network problem resolution to improve system availability and user productivity, reducing the time system programmers spend on network problem diagnosis by more than 90% and accelerating 3745/3746 migration efforts. It also helps identify and alleviate embedded SNA layer traffic fault or flow problems, or speed up transaction performance, assuring that goals in production are being met. Some key features include:

- Supports z/OS Communications Server and IBM Communication Controller for Linux on System

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- z (CCL)
- Interprets VTAM buffer trace fields (the only way to view encrypted TN3270 RU data) with TraceView
- Reduces the time needed to analyze and resolve 3270, TN3270, and APPC network problems
- Breaks down the sequence of execution and timing information for APPC logical sessions within multiple parallel sessions.
- Automates the Start/Stop of GTF traces
- Diagnoses the source of Network Errors using error indications and their associated time stamps
- Generates numerous on-line reports
- DLUR/DLUS sessions and GDS variables analysis

CLEVER eRoute®

CLEVER eRoute expedites enterprise-wide IP route performance management and Service Level control, providing a systematic approach to the organization and analysis of route and segment data. CLEVER eRoute offers the following:

- Scheduling and collection of enterprise-wide performance data, remotely
- Analysis of route performance for the entire network, centrally
- Auto-discovery of routes and patterns, and detailed analysis of all end-points, routes, segment hops, time ranges, and response criteria to establish performance baselines
- IP routing diagnostics for Analysis of defective routes
- Analysis of usage patterns, congestion, and defects for capacity planning
- Management reports including route and segment hop summaries, response times, and defects
- Diagnostic information from SNMP public and private MIBs

AES Affiliations

CleverSoft



CleverSoft, formed in October, 2002, is a wholly owned subsidiary of Applied Expert Systems, Inc. (AES). CleverSoft specializes in Computer Software Architecture, Design, Development, Consulting, and Quality Assurance services. CleverSoft provides superb resources, superior skill sets, and infrastructure.

CleverSoft also possesses superior project management skills, allowing them to work closely with clients in order to fully understand their projects and unique business requirements. Like AES, CleverSoft is committed to delivering high quality end products, software applications and/or modules.

CleverSoft is located in the city of Kunshan, just 30 miles west of Shanghai - the fastest developing city in China. CleverSoft is part of the Kunshan Software Park, a developing network of software companies from all over the world. It has well-equipped offices and exhibition facilities, as well as a complete infrastructure and environment to support software development. Please access www.cleversoft.com for detailed information.

CleverSoft offers powerful software products such as CleverQA® and CleverHR®, powering Global Enterprises with Intelligent Business Solutions.

Distributors



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In addition to our offices in the United States and China, AES is also pleased to be associated with a federation of independent companies in Europe, Asia/Pacific, and South America who provide our customers with sales, support, and service throughout the global marketplace. Please visit the International pages on our Web site to view the companies working with AES.

AES and IBM - Partners in Development

AES is a partner of Tivoli/NetView and is a member of IBM's PartnerWorld® for Developers. In 2000, AES announced the finalization of a joint technology agreement with Tivoli Systems, Inc. This agreement merged the strengths of both companies by utilizing the innovation and experience of AES in the performance monitoring of TCP/IP networks in combination with the worldwide marketing channels and access to technology that Tivoli Systems provides. This new product created with Tivoli established a standard by which all current and future S/390® based IP monitors are measured.

Business Partners

AES is proud to be a Business Partner of distinguished companies: CA®, IBM®, HP®, Red Hat ISV Partner, Silver Novell ISV Partner and member of the Microsoft Partner Network. Designation as a Business Partner assures our customers that they will receive quality products and services that meet these companies' exacting standards.

In addition, AES has earned the right to have our network performance monitoring product, CleverView for TCP/IP, designated as IBM System Storage Proven. Solutions bearing the IBM System Storage Proven Mark have been confirmed by IBM either to be successfully installed and running with an IBM System Storage product in a customer environment or to have successfully completed interoperability testing with specified IBM System Storage products. CleverView for IP Service Performance and CleverView for TCP/IP on Linux are approved for IBM Global Solutions Directory Site.

In Summary

AES focuses on the development of Business Cloud Service and Security Management solutions. Through its strong emphasis on listening to customers, foreseeing far-reaching trends in the marketplace, and providing stellar support systems, AES continues to maintain its lead in providing state-of-the-art, easy-to-use performance tools for the very backbone of e Business. For more information please visit our Web site at www.aesclever.com or email us at marketing@aesclever.com

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