



AIDA-NG

AERONAUTICAL INTEGRATED DATA EXCHANGE AGENT – NEXT GENERATION

HIGHLIGHTS

- Open and fault-tolerant architecture
- Proven interoperability and standard conformance with AMHS, X.400 P1/P3/P7, ATN, AFTN, ADEXP, CIDIN, SITA Type B, ATN Directory (X.500)
- Support of Basic and Extended AMHS Service conformant to ICAO Doc 9705
- OLDI FMTP/FDE gateway functionality
- Automatic flight plan conversion conformant to ICAO Doc. 4444 15th edition and Amendment 1
- Uniform integration of all network types
- Multi-site configuration management
- Excellent performance and throughput capacity
- Service availability of 99.9999% evidenced in a multitude of operational communication centres

COMSOFT





AIDA-NG is COMSOFT's Aeronautical Message Handling System based on the ECG (EATM Communication Gateway) software, which was developed on behalf of EUROCONTROL in 2002 in order to bring uniformity to ground data networks. Moreover, COMSOFT has designed the AIDA-NG product in close cooperation with the challenging demands of leading air navigation service providers.

The rapidly growing community of customers forms the COMSOFT AMHS User Group (CAUG) and significantly contributes to further enhancements of the product with valuable feedback.

With COMSOFT's technical expertise and the clearly defined requirements of experienced operators a system was developed that sets the benchmark for modern AMHS implementation in terms of reliability, performance, functionality and safety. Not only does AIDA NG fulfil all international aeronautical interoperability standards (AMHS, AFTN, CIDIN, SITA, OLDI) but it is also superior to competitive products in its convenient and efficient support of sophisticated operational procedures.

AIDA-NG is the only AMHS/AFTN implementation on the market that provides fully integrated and uniform message handling facilities, such as efficient queue handling and tracing for all connected networks. Message tracing, for example, can be seamlessly performed through the AFTN/AMHS gateway. Multi-site systems (operational, contingency and test/training system) are supported by progressive configuration and administration means.

AIDA-NG is based on up-to-date COTS servers and a powerful LINUX operating system. Therefore, it can be hosted on a variety of current and future platforms. This is particularly important regarding the upgrade path within the system's lifetime.

Its excellent scalability and its supreme upgrade and extension possibilities qualify the system and allow AIDA-NG to keep pace with future developments and their resulting requirements. Due to this flexibility, its user-friendliness and its remarkable performance AIDA-NG is the ideal solution for aeronautical communication centres of any size. Therefore, it is not astonishing that the community of satisfied customers has steadily grown. In 2008, COMSOFT and its customers founded the COMSOFT AMHS User Group with the goal of jointly addressing the demanding needs of today's and future aeronautical communication.

AIDA-NG perfectly fits in with the CADAS ATS/AFTN/AMHS User Agent solution.



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SYSTEM ARCHITECTURE

AIDA-NG consists of three major components: the Core System, the Recording System and the Operator Working Positions (OWP); all of which can be hosted on two or more servers and computers that are interconnected by means of a redundant Fast-Ethernet LAN. Every part of the system is based on highly scalable COTS equipment. Therefore, all parts are independent of one another and can be extended and enhanced individually.

CORE SYSTEM

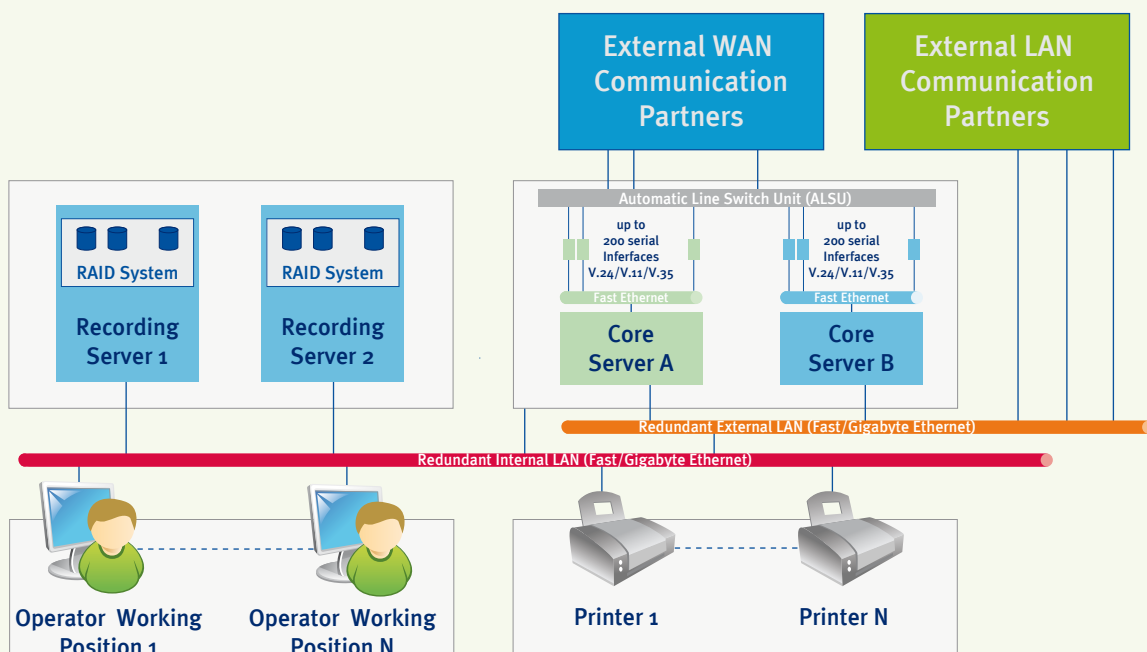
The Core System incorporates communication adaptors, protocol suites, routing and gateway facilities. Due to COMSOFT's fully integrated core architecture all software components interact seamlessly. As a result, the system can not only be administrated in an innovative and efficient way but it also bears unmatched throughput and performance.

The Core System is composed of two identical communication units, which are run in an operational/hot standby combination. Both units constantly supervise each other's hardware and software. In case of failure of the operational unit the hot standby unit is automatically

activated and takes over the operational service within a few seconds and, of course, without loss of data.

The Core System

- performs message handling, central routing tasks and gateway functions,
- houses duplicated physical LAN/WAN interfaces for the connection to external communication partners,
- executes LAN/WAN protocol stacks for the communication with all partner systems,
- is highly extensible in terms of performance and number of interfaces.



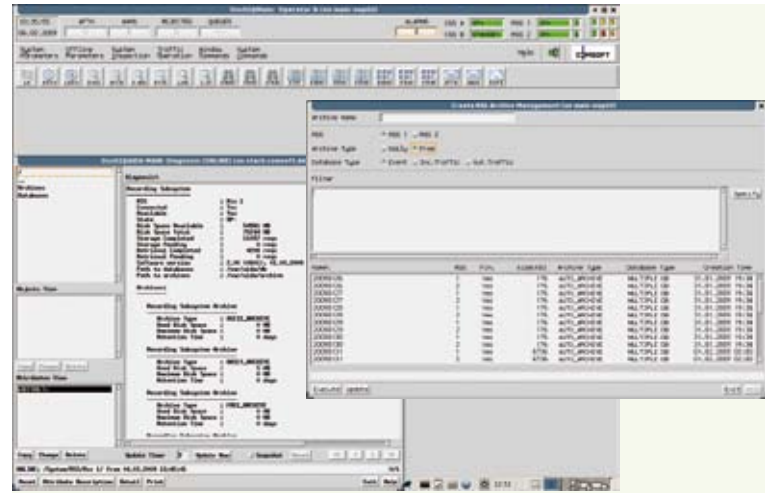


RECORDING SYSTEM

The Recording System has two identical, mirrored database servers which are operated in parallel. The mirroring of the database servers is performed in the background with no effect on general operation.

The Recording System

- is a fully redundant database system,
- stores the traffic, statistical, and technical event databases (storage period configurable by database type),
- maintains static databases (system configurations, templates, archives and other data),
- allows operators and applications to access all databases and archives directly and simultaneously.



RSS Diagnosis

OPERATOR WORKING POSITIONS

The Operator Working Position is the comfortable interface between user and system that provides uniform administration and monitoring facilities for all system components, networks and data. Every Operator Working Position is identical in its hardware and software and therefore provides the complete functional scope.

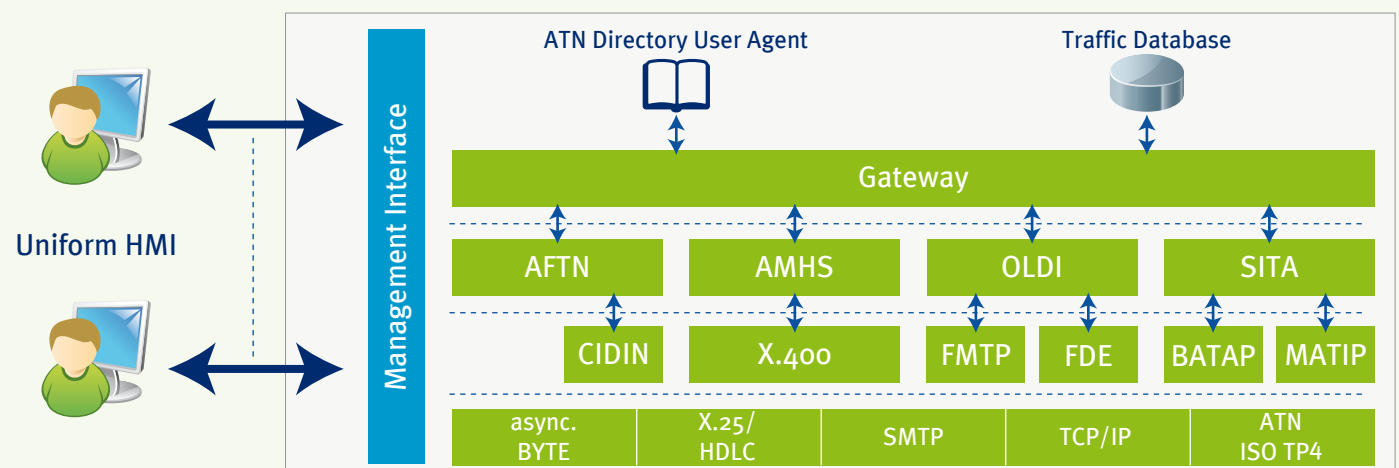
The elaborate access right management grants both administrators and operators access to the respective system resources that are related to their tasks in the organisation. Any number of Working Positions can be installed and used simultaneously.

Apart from hierarchically structured dialogues, menus and icons an object browser gives fast and direct access

to related objects, such as system parameters and diagnostic values.

The Operator Working Positions

- provide a user-friendly HMI to access system resources, configurations, messages and queues,
- support team work by means of a sophisticated resource sharing concept,
- allow efficient access control by individually configurable user profiles,
- provide all system resources with simultaneous reading access,
- perform online checks on all entered data.



CONNECTIVITY & INTEROPERABILITY

AIDA-NG excels with its high connectivity to both legacy and new adjacent systems. AIDA-NG supports a variety of protocols and network types applied in aeronautical communications such as AFTN, CIDIN, AMHS, SITA and OLDI. When designing AIDA-NG, special attention was paid to the new AMHS standard and the system's

ability to connect to ATN directory services based on X.500. AIDA-NG has shown excellent interoperability in a multitude of international field trials and finally, AIDA-NG has evolved to the worldwide leading product in operationally used AMHS implementations.

REDUNDANCY & AVAILABILITY

The most effective way to achieve high service availability is to duplicate the system components. Thus, the system avoids the single point of failure of shared hardware components as typically used in standard cluster solutions available on the market. The AIDA-NG solution

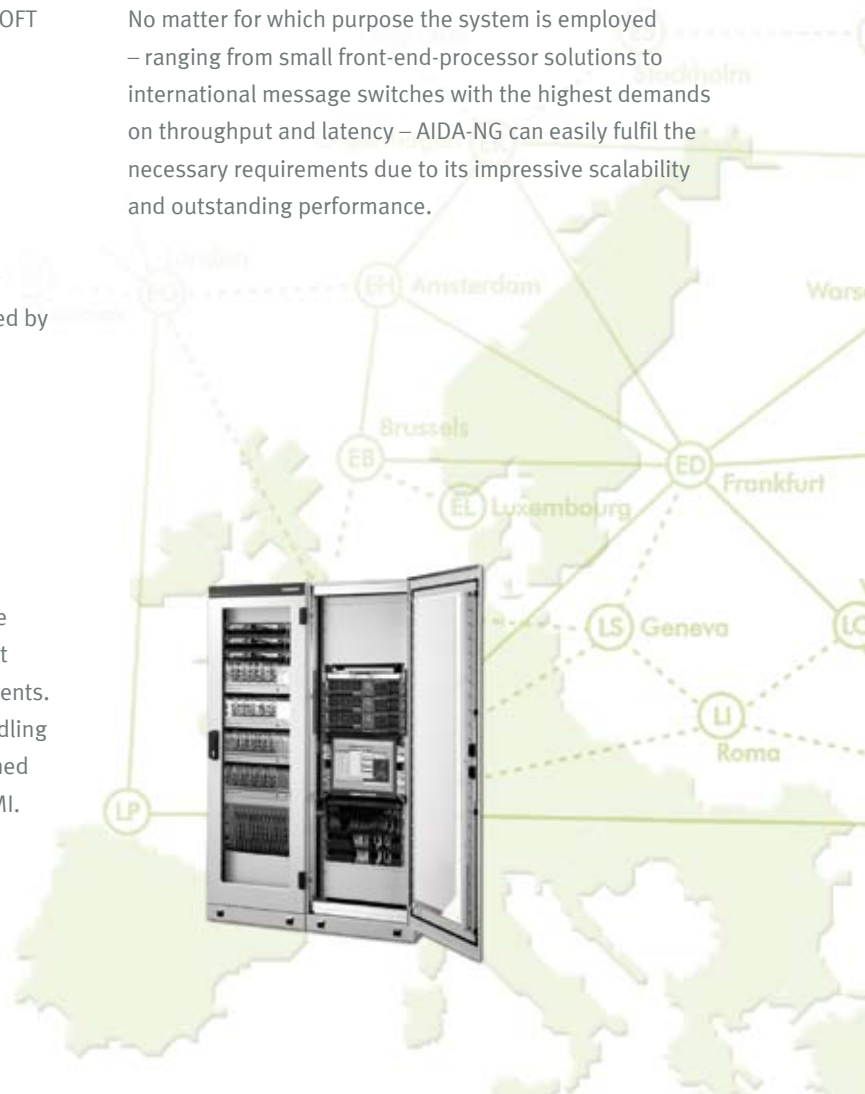
puts this approach consistently into practice as all of its major system components are duplicated. Power supplies, disks and network adaptors are also redundant. The benefit of this layout is a proven service availability of more than 99.9999%.

ECG

ECG is the EATM Communication Gateway that COMSOFT developed for EUROCONTROL and its member states in 2002. ECG has made a significant contribution to the harmonisation of European air traffic because of its interoperability with current and future networks. This, in turn, makes ECG the utmost flexible and versatile gateway. COMSOFT's ECG software package was implemented according to EUROCONTROL's user requirement specification (URD) and officially accepted by EUROCONTROL after a period of extensive testing.

COMSOFT further developed and enhanced the ECG technology within its AMHS product AIDA-NG, thus ATC centres in Europe and the world can benefit from this achievement. AIDA-NG incorporates all benefits and advantages that ECG provides but also exceeds its specifications. In fact, the system is a leading-edge solution owing to its continuous adaption to pertinent ICAO standards and customers' challenging requirements. So far such adaptations include unified message handling for AMHS, AFTN, CIDIN, SITA and OLDI networks, refined message handling facilities and a self-explanatory HMI.

No matter for which purpose the system is employed – ranging from small front-end-processor solutions to international message switches with the highest demands on throughput and latency – AIDA-NG can easily fulfil the necessary requirements due to its impressive scalability and outstanding performance.





CADAS-ATS: THE AIDA-NG USER AGENT COMPLEMENT

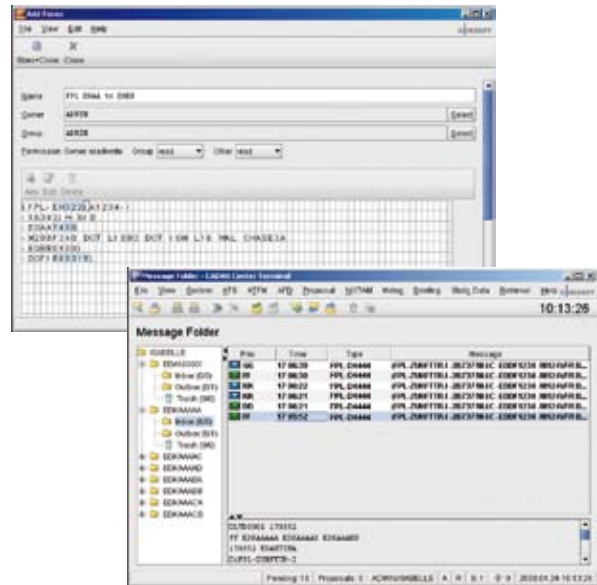
COMSOFT's Aeronautical Data Access System (CADAS) is a cutting-edge web-based ATS user terminal system that provides advanced, yet convenient, access facilities to all services related to ATC and aeronautical data. Innovative concepts facilitate and improve ATS messaging considerably, while keeping the focus on ATC-specific work-flows and maximised ease of use.

CATS: COMSOFT AMHS TEST SUITE

CATS is a multi-purpose AMHS test tool focusing on automated AMHS conformance testing. Evidence of AMHS conformance is an essential prerequisite for AMHS interoperability and pre-operational testing and, last but not least, the operational usage of AMHS in line with the regional ICAO AMHS Manuals. The automated test execution and evaluation of the results significantly speeds up the conformity assessment of an AMHS implementation (MTCU, MTA, User Agent) regarding the ICAO standards, not only for initial assessment but also for recurring regression testing subsequent to new software release implementations.

Consultancy and training services by COMSOFT's AMHS experts ideally complement this product and assist air navigation service providers with the introduction and expansion of AMHS.

NOTAM & Form Editor



CADAS Terminal

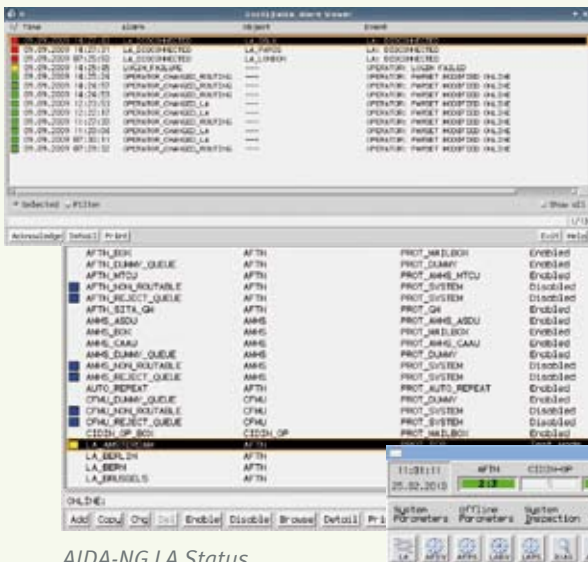
COFFEE: COMSOFT OLDI FMTP/FDE ENHANCED GATEWAY

According to the Commission Regulation (EC) 633/2007, all EATMN systems shall realise their On-Line Data Interchange (OLDI) by means of the FMTP/IPv6 protocol as of April 2011.

COFFEE bridges the gap between FMTP TCP/IP-based and FDE-ICD X.25-based OLDI message exchange. Resolving the conflicts between these message formats, the gateway converts OLDI messages between the FMTP and FDE-ICD format, thus enabling transparent end-to-end communication between OLDI systems.

As COFFEE is based on COMSOFT's universal gateway and messaging technology, it is the optimum approach to address the ANSPs' need to connect existing OLDI applications to IPv4 and IPv6 networks at low risk for budget, schedule and flight safety.

AIDA-NG Alarm Viewer



AIDA-NG LA Status

AIDA-NG System Status

RELATED PRODUCTS

AIDA-FPL: FLIGHT PLAN FORMAT CONVERTER (FPL 2012)

According to Amendment 1 to ICAO Doc. 4444 the format of flight plans will be extended and this change will be applicable on 15. November 2012. This induces changes to all ATC systems that use flight plans and related messages. At least during the transition period both the present and new flight plan format will be used in parallel which induces the need for transformation between both formats.

AIDA-FPL is a converter which automatically transforms flight plan messages from the new flight plan format into the present format according to the ICAO-recommended conversion tables.

CNMS: COMSOFT NETWORK MANAGEMENT SYSTEM

CNMS is an advanced flexible Network Monitoring System suitable for virtually all kinds of control and monitoring tasks. It monitors and displays the IP network status as well as the status of software applications and system hardware in a fully integrated way. Thus, it considerably simplifies the task of managing the system by a unified user interface for the relevant monitoring tasks.

Maintenance staff can easily navigate from a graphical top-level system overview to a detailed component view. The open architecture of CNMS fully supports the need for high flexibility and extensibility requirements of many operational environments.

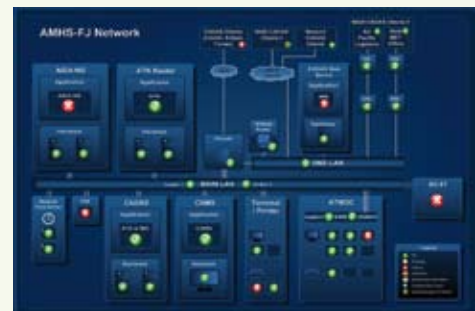
Examples of CNMS Screen Shots:



Object Status Indications



Top-level System Status Display



Network View

Host	IP	System	Host	Language	Status	Message
192.168.1.1	192.168.1.1	AMHS-FJ	AMHS-FJ	English	OK	Trap for severity with severity 'Warning': 10.10.2010 10:10:10 AMHS-FJ-001: AMHS-FJ-001 OK
192.168.1.2	192.168.1.2	AMHS-FJ	AMHS-FJ	English	Warning	Trap for severity with severity 'Warning': 10.10.2010 10:10:10 AMHS-FJ-002: AMHS-FJ-002 OK
192.168.1.3	192.168.1.3	AMHS-FJ	AMHS-FJ	English	Critical	Trap for severity with severity 'Warning': 10.10.2010 10:10:10 AMHS-FJ-003: AMHS-FJ-003 OK
192.168.1.4	192.168.1.4	AMHS-FJ	AMHS-FJ	English	Unknown	Trap for severity with severity 'Warning': 10.10.2010 10:10:10 AMHS-FJ-004: AMHS-FJ-004 OK
192.168.1.5	192.168.1.5	AMHS-FJ	AMHS-FJ	English	Scheduled DownTime	Trap for severity with severity 'Warning': 10.10.2010 10:10:10 AMHS-FJ-005: AMHS-FJ-005 OK
192.168.1.6	192.168.1.6	AMHS-FJ	AMHS-FJ	English	Unavailable/Config Error	Trap for severity with severity 'Warning': 10.10.2010 10:10:10 AMHS-FJ-006: AMHS-FJ-006 OK
192.168.1.7	192.168.1.7	AMHS-FJ	AMHS-FJ	English	Administrative Problem	Trap for severity with severity 'Warning': 10.10.2010 10:10:10 AMHS-FJ-007: AMHS-FJ-007 OK

SNMP Trap Summary



Detailed Component View



Administration capabilities directly influence the total cost of ownership of a system.

AIDA-NG's centralised concept helps to keep maintenance costs at a minimum. AIDA-NG is equipped with tools that allow a centralised administration of main and contingency system, further allowing the user to manage software releases and administer global system configuration data centrally. After power-up, all subsystems are updated automatically with all required data.

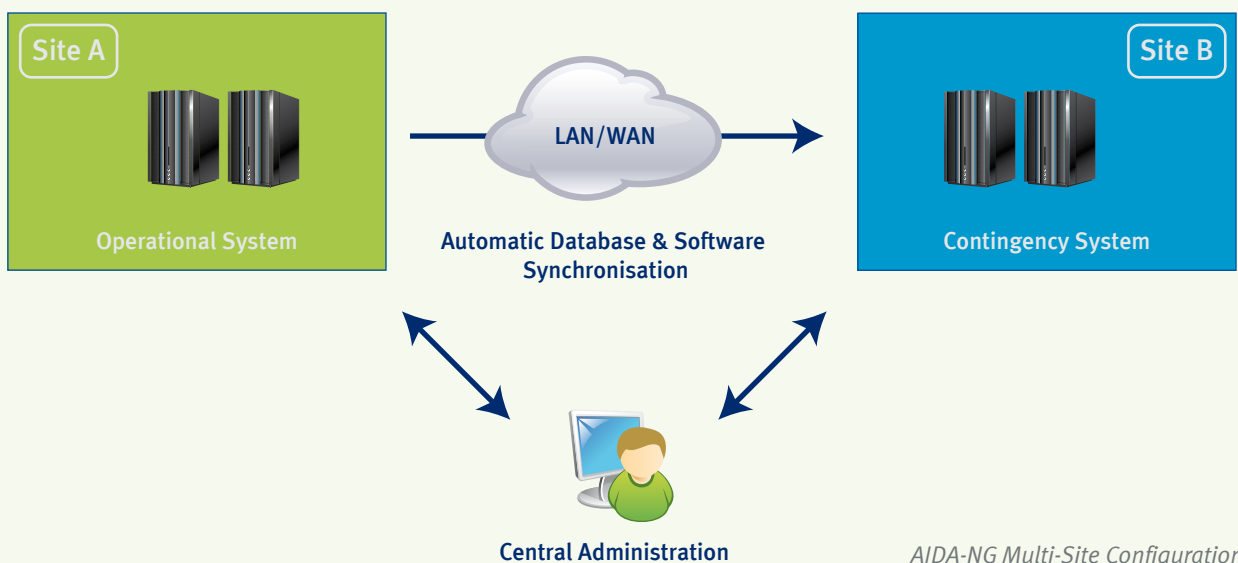
The individual components that make up the system can be monitored by one or many Operator Working Positions simultaneously. The Working Positions display the state of both the system as a whole and its major single components so that all operators are continuously informed about status changes. The Operator Working Positions also immediately display any irregular state of peripheral network components monitored by means of SNMP.

Further AIDA-NG implementations at remote locations such as additional contingency and test systems can additionally be administered, monitored, and controlled by the very same OWP. The database of a remote contingency system can be configured to automatically

synchronise with the operational database via the IP-network.

This brings about the following advantages:

- No more time-consuming and error-prone manual software installations and upgrades on single system components and remote sites.
- Centralised management of numerous systems helps to reduce personnel costs; flexibility and surveillance functions are increased.
- The smooth switchover from one site to another makes contingency management very swift and simple. Switching over the operational services can be performed within minutes.



CENTRALISED SYSTEM ADMINISTRATION

SYSTEM INSPECTION

Throughout all levels, the system permanently collects diagnostics and statistics of all available resources and displays them in real-time, such as:

- system component states and resources,
- message routing,
- remote connection states and protocol-stack-related values (data line monitoring),
- operating system and hardware states.

Based on diagnostic values the system generates absolute, average and peak statistics in different resolutions (minute, hour, day, month, year). All values can be displayed, printed, and exported

to built-in or external spreadsheet applications such as Microsoft® Office Excel. The connection status to communication partners can be visualised in logical and geographical maps.

SYSTEM PARAMETER HANDLING

- Virtually all system parameters can be changed and activated online without the need to restart the system.
- The hardware-related configuration is part of the system parameters. The modification of these parameters neither influences the system's performance nor its availability.

- Parameter input is menu-driven and facilitated by selection lists.
- Input values are immediately checked on validity and again cross-checked against related parameters restraining the user from entering inconsistent data. This, in turn, enhances the system's high robustness and outstanding stability.

EVENT & ALARM HANDLING

- All modifications in the system are reported and stored as events.
- The visual and acoustic presentation of events can be configured individually with the help of the corresponding alarm attributes.

MESSAGE DATABASE HANDLING & ARCHIVING

- The storage period is configurable (up to several years). All stored data is accessible online. No distinction between short-term and long-term storage is necessary.
- Data can be automatically and manually archived to removable media and can be viewed with the same powerful tools as the online databases.
- AIDA-NG provides a unique and uniform message tracing function which is independent of the respective message type. This makes it possible to retrieve, for example, an incoming AFTN message and to trace its related outgoing AMHS messages and vice versa.
- Flexible filters facilitate systematic message retrieval.



Connections Europe

TECHNICAL DATA

PERFORMANCE

- AIDA-NG systems have been tested and approved to switch a permanent load of 400 AMHS and AFTN messages per second at an input/output ratio of 1:2. High message loads do not affect the excellent response time of the Operator Working Positions.
- Overload situations are prevented by means of extensive flow control mechanisms.
- Certain circumstances, such as a great number of queued messages caused by temporary outages of communication partners, do not affect the overall system performance.

ROUTING & MESSAGE HANDLING

- AIDA-NG provides integrated standard AFTN, CIDIN, SITA, OLDI and AMHS message routing and gateway functions.
- Standard table-based routing functions are accomplished by the possibility of copying, redirecting and pausing messages.
- AIDA-NG can act as a mere gateway between networks since it can switch messages transparently.
- Received/transmitted messages can be monitored online per circuit.
- Pending messages in outgoing queues can be monitored online (per circuit), accessed directly and re-routed, redirected to other destinations, blocked and removed.
- AIDA-NG harmonises the queue handling procedures for all supported networks.
- Outgoing message queues are permanently checked as regards their length and whether they contain messages with an expired lifetime (overdue messages).
- Messages to be processed (copied, redirected etc.) can be explicitly specified by means of flexible filters.

Core System

- Two Intel® processor-based servers
- Operated in operational/hot standby configuration
- Up to 200 redundant WAN interfaces (V.24/V.11/V.35)
- Up to eight redundant LAN interfaces (Gigabit/Fast Ethernet)
- Linux Operating System

Recording System

- Two Intel® processor-based servers (or co-hosted with the Core System)
- Operated in “mirrored server” configuration
- Each server equipped with high-volume storage systems in RAID 5 configuration
- Linux Operating System

Operator Working Position

- Up to 99 Intel® processor-based workstations
- Linux Operating System
- X-Windows system

Time System

UTC-based using DCF77, GPS, NTP, IRIG-B

Throughput

Permanent switching capability of more than 500 messages/sec

Reliability

Operationally measured availability higher than 99.9999%





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