Contrail Base Station

Total Control of Your Hydrometeorological Network Data and Information Distribution

Contrail Base Station is the visualization tool of choice when managing and controlling access to your hydrologic data is critical. Contrail supports the real-time data collection, processing, archiving and dissemination of your hydrometeorological and water resources data in one place.

HIGHLIGHTS
- On-premises enterprise edition of Contrail collects, validates and makes data available inside your organization
- Supports an unlimited number of users via a single or multiple web sites
- You control user access; expose your data as needed
- Makes available historical and real-time data
- View real-time and historical gauge-adjusted radar rainfall
- Access outside information such as USGS, HADS and METAR, as well as neighboring systems

OPTIONAL
- 24/7 system health monitoring
- Automated problem notification
- Data backup and recovery
- Redundant, replicated databases
- Remote troubleshooting and technical support
- On-line software upgrades

Contrail collects, validates, processes for alarming and notification, displays on maps, graphs and tables, archives, exports and disseminates hydrometeorological data and information, including gauge-adjusted radar rainfall and inundation maps. Encompassed are tools and reports for sensor management, rainfall and stream-related reporting, maintenance, and custom alarm and notification features. OneRain’s solutions enable management of and quick access to water-related emergency action plan content, links to any outside resources, webcam video feeds from difficult sites, and many other web-hosted tools.

Makes Decision-Critical Support Data Highly Available
Contrail is used for operational decision support and emergency operations, post-event analysis, model calibration and planning in flood early warning, dam safety and operations, stormwater and wastewater management.

The Contrail application is configurable to suit specific user needs, for multiple user groups and different types of users simultaneously. The user interface is a common web browser—all recent browsers are supported. Real-time data exchange with other applications is also web/http-based, making firewall issues less problematic when exchanging data among agencies. Contrail’s smart interface is adaptive and responsive with optimized performance for Web-enabled mobile devices.

Scalable and Reliable Software Architecture
Running on Linux™ and using a MySQL® database engine, a base station can receive data from any number of sources, sensors and sensor types, and serve any number of different uses. Most licensed server implementations operate at least two servers that are geographically separated, with automated real-time replication of the databases between the two providing redundancy. The database is not limited in size and can grow across multiple servers and disks. Contrail Base Station is the same software that runs behind OneRain’s reliable enterprise level SaaS solution, Contrail Web.
OneRain's mission is to provide industry leading solutions that empower our clients to perform their critical missions.

**Multiple Data Exchange Options**

Multiple formats are available for automated exchange of data with other systems. Contrail's application programming interface (API) can enable many output data formats for use by other systems such as XML, Standard Hydrologic Exchange Format (SHEF), Hydstra, AQUIRUS, ASCII text, Excel. There's also a standard data exchange interface that can be accessed by authorized processes using scripts (e.g., Python, Perl, Java, VB.NET, etc.) on other platforms that wish to retrieve data from or offer data to Contrail.

Contrail includes Data Collectors and Data Agents. Data Collectors receive real-time ALERT, ALERT2™, satellite, cellular and TCP/IP data. Data Agents actively retrieve, automatically and periodically, web-resident data sources such as USGS, NWIS, METAR, HADS, TIDES, RIWS and other sites of interest.

**You Control Who Sees Your Data**

The database architecture is multi-tenant, which means it can be configured for privacy of data within secured user domains. Each user domain is completely under the control of its own administrator(s), who in turn control user access (username/password secured, public "guest") and user privileges. Different privileges can be assigned as appropriate to individual users (viewing data only, alarms viewing, alarms creation, maintenance of sensor and site data, web-site content editing, style and colors, fonts, display icons used, etc.).

**Build Custom Definable Alarms and Delivery Notifications**

Create user definable rules for alarms to notify via text messages and e-mail. Contrail provides a powerful Boolean equation tool set for identifying conditions of interest. Writing equations in the Alarm rule functions are at your finger-tips. Administrators can create customized rules to trigger an alarm for any sensor or group of sensors within your program. You can have different messages delivered to different people all from the same triggered event—send a short mobile-text message to your on-call staff, send a longer descriptive email to managers, including action plans, send a message to a different department, or send no messages at all; the icons still change color and the Alarm Manager still maintains your event history.

**Contrail Inventory Plus - Centralized Web-based Asset Tracking & Maintenance**

Knowing the equipment model and all the relevant information associated with a given sensor—its geographical map location, configuration, firmware, cables, spare parts, repair and maintenance records, etc., can be invaluable to your field maintenance operations. Contrail Inventory supports mobile data collection for your field service technicians and engineers to track and manage inventory in the field, create Work Orders for maintenance management, and updates back to the centralized database.

Both static and pan-and-zoom maps are supported for data display. Flood warning implementations may include inundation maps that are user controlled layers on the map display. High-resolution, custom maps clearly define sensors and their status. Point and click drill-down to sensor data. At the site or sensor level, Webcam and web video data can be linked into Contrail by authorized administrative users with bookmarks and tailored supporting content.

**Real-Time Displays and Post-Event Reports**

Contrail real-time displays and post-event reports characterize rainfall and its consequences for its users. For example, the Rainfall Summary table shows rain gauge totals in real time for gauges that can be grouped by area/basin. The Water Level Summary table shows water levels in real time with respect to channel bottom, flood alert level, flood level and historic record levels. Rainfall Intensity reports using Contrail Analytics can summarize, grouped by basin or region and individually as gauges, the recurrence probability of a rainfall event over different durations (e.g., 5-year 1-hour rainfall, 5-year 24-hour rainfall, etc.).

**Multigraphs and Hyetographs**

Multigraphs showing stream flow or levels together with hyetographs from nearby rain gauges can be user-created and bookmarked for repeated use. Any graph in use (can be multiple ones in new windows) will update with new data according to the base station's configured refresh rate (e.g., once a minute). Graphical displays can also show various alarm and historical thresholds.

Contact Us

For more information about OneRain's Contrail software, visit onerain.com or call 1-800-758-RAIN (7246) or 303-774-2033. We're happy to arrange a demonstration and show real life examples of Contrail in action.
Contrail® Base Station Features

- Enterprise software application deployed on your organization’s network for Intranet / Internet browser-based access for both Users and Administrators
- Responsive and Adaptive design for optimal use across a wide range of devices such as desktops, laptops, tablets, mobile phones
- Unlimited number of Users with role-based privileges and security settings
- Onsite Mission Critical Base Station
- Local / On-Site Data
- Web Content Management
- Web Styling and Branding - customizable theme colors and logo
- Public website(s)
- Highly scalable, Linux®-based server running a MySQL enterprise database
- Read Only Server Option
- Redundant Server Replication
- Multi-Client (first 5 client Web sites)
- Administrator Managed Database Backups
- Custom Configured Data Services
- Custom Defined Cache and Refresh Controls
- Reload Metadata - Sync Configuration
- Data Collectors / Control: Serial or TCP/IP Connection options, Two-way ALERT (Flasher and Repeater Control), ALERT2™, StormLink™ Cellular, StormLink IP (logging / queuing), StormLink Satellite, RWIS / NTCIP, Modbus®, Custom Collector Programming
- Data Agents / Data Exchange: DIAvisor™, USGS, METAR, HADS, CDEC, LRGS /GOES, NOAA Tides, RAWS, Riguid (EVENTS), Wonderware, Campbell Scientific, ORB, GoData, Custom Data Agent, SHEF .A, SHEF .E, Tabular, XML, Hydstra...
- Unlimited Sensors
- Unlimited Online Data File and Image Management
- Advanced Alarm Management: Boolean / Expert Equation toolset
- Flexible Alarm Delivery Notifications: Contacts and Groups management for user definable alarms notify via pager, cell phone, and email
- Value to text translations - define translation tables to map numeric values to text strings for Contrail data display. Useful for intrusion sensors on doors, float switches, road way sensors
- Online Reports: standard built-in reports and custom online reports
- Map View: Static and Pan-and-Zoom
- Rain Gauge Display
- Graphing: real time graphs that keep data on the graphs current with new data. Graphs auto refresh automatically at timed intervals. Easy to use Date Range buttons. Style thresholds with different lines, colors, and markers.
- Bookmarks: save links to your favorite graphs or any other Contrail web pages for easy access in the future
- File Export / Sensor Data Export (MS Excel / CSV)
- Data Editing (with audit trail)
- Data Revalidation (with audit trail)
- Services: scheduled reports via email, database backups, Data Exchange API
- Contrail Inventory plus: Field maintenance operations and inventory management
- Contrail TDMA Manager: ALERT/ALERT2™ network design and provisioning

System Requirements

- CPU: Dual Core 2.0 GHz
- RAM: 2 Gb DDR-2
- Optical Drive: 1 24x IDE CD-ROM
- Data Storage: 80 Gb
- Operating System: CentOS 6, or Red Hat® Enterprise Linux® (RHEL) 6

Incoming Network Ports: Some open network ports are required as follows:

- 80 Web Access to Contrail Web on the server
- 8080 Contrail Data Exchange interface
- 8181 Contrail Inventory application
- 3306 MySQL access
- 22 Default ssh port (sometimes moved to an off port for security)
- 60001 - 60010 Reserved for Stormlink IP (logging queuing ALERT data collection)
- 60011 - 60020 Reserved for ALERT2 (feed from decoder to base station, usually via a serial to IP conversion)
- 60021 - 60030 Reserved for ALERT data collection (usually via a serial to IP converter)
- 60031 - 60040 Reserved
- 60041 - 60050 Reserved for StormLink cellular data collection
- 60051 - 60060 Reserved for StormLink Satellite (IDP) collection
- 60061 - 60070 Reserved for ALERT two-way service

Outgoing Network Ports: Outgoing ports to support data feeds and software updates:

- 25 SMTP (Simple Mail Transfer Protocol). Required for Contrail to send emails and text messages from alarms. Also used to send reports and notifications of system events.
- 80 and 8080 Allows data agents to bring in data like USGS, METAR, or FFG
- IP Outgoing Access / 443: Required for software updates: Redhat (or CentOS), and Onerain (handled by allowing IP outgoing access to specific IP or ranges of IP addresses)

Supported Web Browsers: Microsoft Internet Explorer, Mozilla Firefox, Apple Safari, or Google Chrome (latest versions).

Note: OneRain does not test or certify Contrail Base Station to run on specific virtualization solutions.

Experts measuring rainfall and its consequences™