

# GENESIS SOFTWARE SOLUTION BRIEF

# GENESIS OPERATIONS BRIDGE

CONSOLIDATE EVERYTHING • ELIMINATE THE NOISE • DRIVE RAPID RESPONSE

The **Genesis Operation Bridge (OB)** is a browser-delivered “Manager of Managers” solution specifically designed for the total management of an ASTRO® 25 radio system, as well as all related network infrastructure. The solution helps bring “calm to the chaos” by providing System Administrators tools to improve service quality and reduce overall service costs. This allows System Administrators to cut down the time to repair and prioritize workloads more efficiently in order to maintain better performing and available services.

## OPERATIONS BRIDGE HELPS ELIMINATE “SWIVEL CHAIR” MANAGEMENT

Typically, a System Administrator is tasked with managing the fault and performance of many disparate networks of an ASTRO 25 system simultaneously (e.g., radio network, microwave backhaul, voice loggers, IP networks). Each of these networks likely come with their own monitoring tool making it nearly impossible to truly manage any of them effectively let alone identifying which alarms are directly related to the root cause. This is commonly referred to as “Swivel Chair Management” and is depicted in **Figure 1**. To assist with this, the OB collects topology (what devices and how they are connected together), faults/events, and performance metrics from all equipment being monitored and displays it in a “single pane of glass” view.



Figure 1: Depiction of Eliminating “Swivel Chair Management”

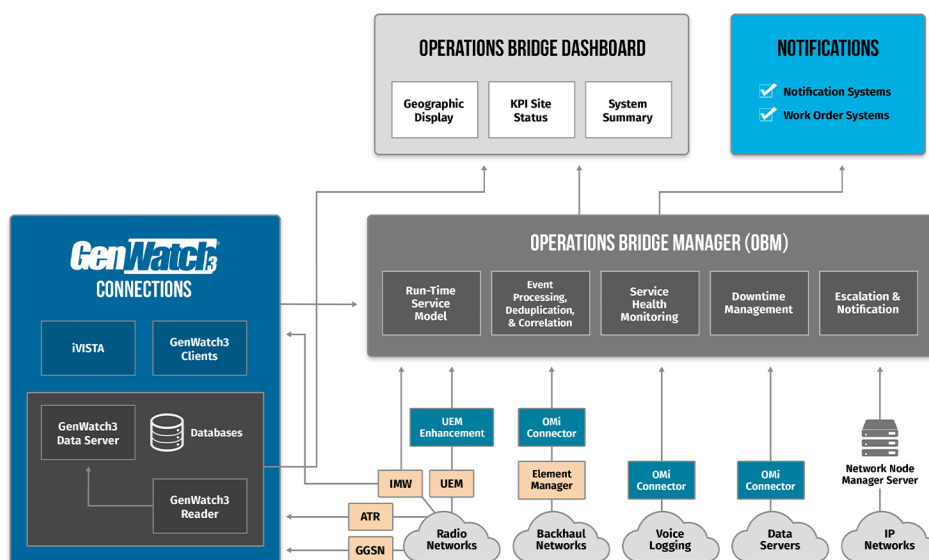


Figure 2: Genesis Operations Bridge Architecture

## PERFORMANCE AND FAULT DATA IS GATHERED AND DISPLAYED INTELLIGENTLY

As mentioned, the purpose of the OB is the total management of an ASTRO 25 system. **Figure 2** represents the type of information flowing into the solution. The OB receives radio traffic and system performance data from the ATIA stream via GenWatch® ATIA and the Motorola UEM via the GenWatch UEM Enhancement.

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## OPERATIONS BRIDGE MANAGER IS THE HEART OF THE SOFTWARE

The main benefits of the OB, as previously stated, is to improve service availability and performance, and detect and resolve faults quicker. The OBM, which is the heart of the solution (**Figure 2**), enables this to occur by providing the following functionality:

- **Real-Time Service Health Modeling (RTSM):** Received events are matched to a particular service in real-time by understanding where the event came from and on what device.
- **Event Processing:** Duplicate events or those that are not needed are removed. Events are also able to be correlated together based on a specific pattern to determine a root cause.
- **Service Health Monitoring:** Impacts to the RTSM can trigger special events such as escalation to a work order system.
- **Downtime Management:** System Administrators are able to define downtime to avoid an impact to any Service Level Agreements (SLA) that may be in place. Planned downtime is reflected in the RTSM.

## ALL NETWORK EVENTS ARE CENTRALIZED IN A SINGLE PANE OF GLASS

The OBM Event Browser (EB) screen (**Figure 3**) displays events, as they are occurring, from every network that is being managed. The events are brought into a centralized view, otherwise known as a 'single pane of glass', and done so intelligently.

On the left-hand side of the EB is an exploratory of the network which includes the Motorola ASTRO 25 Radio System and its associated sites. Expanding each site will show all of the controllers, repeaters, routers, IP links, microwave equipment, etc that is being monitored. Navigating through the individual parts of the network automatically filters the events within the EB to the alarms related to that particular piece of equipment. Events are also able to be filtered through a quick search at the top of the EB menu.

Events that are received by the OBM have their device IP address mapped to a device description located in the CMBD. That description is conveyed in plain English allowing the System Administrator to easily identify the nature of the event, where the device is located and the device exhibiting the fault.

In addition to the device description, each event record includes its severity level, which ranges from critical to good, a timestamp of when the alarm was received, the age of the event, as well as whether or not any event correlation has taken place. Event Correlation is represented by an icon under the "C", for Correlation, column of the EB (**Figure 3**).

Sev	C	N	D	State	Time Received	Age	Category	Related CI	Title
✓					7/23/20 01:20:59 PM	2min	ASTRO	Houston DU 6.1 LINKRAC2	CLEAR: Slot2 Module is missing - System
✓					7/23/20 01:20:59 PM	2min	ASTRO	Houston DU 6.1 LINKRAC2	OUT OF WIDE SERVICE, NO RFA FROM SITE
✓					7/23/20 01:19:59 PM	3min	ASTRO	ASTN Trunking Status	NOT WIDE TRUNKING, SITE CONTROL PATH 0
✓					7/23/20 01:19:43 PM	3min	ASTRO	SHAN Base Radio 1	OUT OF WIDE SERVICE, NO RFA FROM SITE
✓					7/23/20 01:19:09 PM	3min	ASTRO	Houston DU 6.1	CLEAR: Synchronization signal restored - System
✓					7/23/20 01:18:02 PM	5min	ASTRO	Houston DU 6.1 LINKRAC2	CLEAR: DU01 Bit error rate (BER) threshold of 5
✓					7/23/20 01:17:49 PM	5min	ASTRO	Lubbock LINK3	CLEAR: Port 1 Link up - System
✓					7/23/20 01:16:58 PM	5min	ASTRO	Lubbock LINK2	CLEAR: Port 1 Link up - System
✓					7/23/20 01:16:01 PM	5min	ASTRO	Houston DU 6.1 LINKRAC2	CLEAR: Slot2 Module restored - System
✓					7/23/20 01:15:50 PM	7min	ASTRO	Houston DU 6.1 LINKRAC3	CLEAR: Slot3 Module restored - System
✓					7/23/20 01:15:28 PM	7min	ASTRO	Houston DU 6.1 POWER1	CLEAR: Slot1 Module restored - System
✓					7/23/20 01:15:04 PM	7min	ASTRO	Houston DU 6.1	Possible main power supply failure - System
✓					7/23/20 01:14:33 PM	8min	ASTRO	Houston DU 6.1	Loss of Comm - Device or network failure
✓					7/23/20 01:13:53 PM	8min	ASTRO	Houston DU 6.1 Port4	Ethernet Port 4 Link down - System
✓					7/23/20 01:12:38 PM	10min	ASTRO	Houston DU 6.1 TRK3	Trk3 Port 1 Loss of Signal - System
✓					7/23/20 01:12:25 PM	10min	ASTRO	Houston DU 6.1 POWER1	Slot 1 Voltage supplied is outside of acceptable
✓					7/23/20 01:12:07 PM	10min	ASTRO	Houston DU 6.1 POWER1	Slot 1 Backup power supply not detected - System
✓					7/23/20 01:09:42 PM	13min	ASTRO	Lubbock LINK2	DU01 Transmitt path has been lost - System
✓					7/23/20 01:07:09 PM	15min	ASTRO	Houston DU 6.1	Synchronization signal lost - System
✓					7/23/20 01:06:13 PM	16min	ASTRO	Houston DU 6.1	System Clock is in holdover - System
✓					7/23/20 01:05:02 PM	17min	ASTRO	Houston DU 6.1 Port3	Ethernet Port 3 Link down - System
✓					7/23/20 01:05:41 PM	142 N/A	ASTRO	Amarillo LINK3	DU01 Bit error rate (BER) threshold of 10^4 has

Figure 3: OBM Event Browser

## EVENTS ARE CORRELATED TOGETHER UNDER A ROOT CAUSE

Event Correlation helps to reduce unnecessary clutter in the EB by only displaying the root cause. Although only the root cause event is shown, all related symptomatic events are still captured. Selecting an event where correlation is present and then 'Related Events' at the bottom of the EB screen (**Figure 4**), will reveal the list of symptomatic events that came in at the same time and contributed to the root cause. Although the OB is collecting these individual events, the priority of the software is to focus more on the service impact resulting from these events. In other words, even though a singular device might have failed and is in a critical state, that may not mean the available services for the entire site where that device is located are also critical.

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## SERVICE HEALTH MONITORING HELPS PRIORITIZE RESOURCES

The OBM Site Status (SS) view (**Figures 5a & 5b**) will show the overall service impact to the network. This screen provides System Administrators with the information needed to properly prioritize workloads.

To best illustrate the importance of the SS is to compare both Austin (ASTN) to San Antonio (SNAN). **Figure 5a** shows that ASTN is in a CRITICAL state, and SNAN (**Figure 5b**) has a MINOR severity level. Hovering over the upper right-hand corner of each box will unveil three vertical dots. Clicking on the dots will provide a drop down list of Key Performance Indicators (KPI) and their current severity status. The KPIs for each site indicate ASTN has lost Trunking Availability and SNAN's Channel Capacity has been impacted. Therefore, it is logical that a System Administrator would allocate resources to ASTN. If, however, a System Administrator were to make resource decisions based on an individual event from the EB, that decision regarding where to allocate resources may not be as straightforward.

Referring back to the EB (**Figure 3**), both ASTN and SNAN have events that have been flagged as CRITICAL; ASTN is “not wide area trunking” and SNAN has a failed base station. Because SNAN has additional base stations that are active and working properly, while capacity may be impacted, users at that site are still able to communicate hence the MINOR severity level within the SS. However, ASTN has completely lost its ability to trunk which is why it shows as CRITICAL in the SS.

## PRESERVE SCREEN REAL ESTATE TO WHAT'S MOST IMPORTANT

For systems with a large number of sites, and to preserve screen real estate, System Administrators can filter the sites to only those that have a problem. This is done by selecting the specific severity levels in the legend at the bottom right-hand side of the screen (**Figures 5a & 5b**). If a site were to experience a problem and then get resolved, the notification within the SS would automatically disappear.

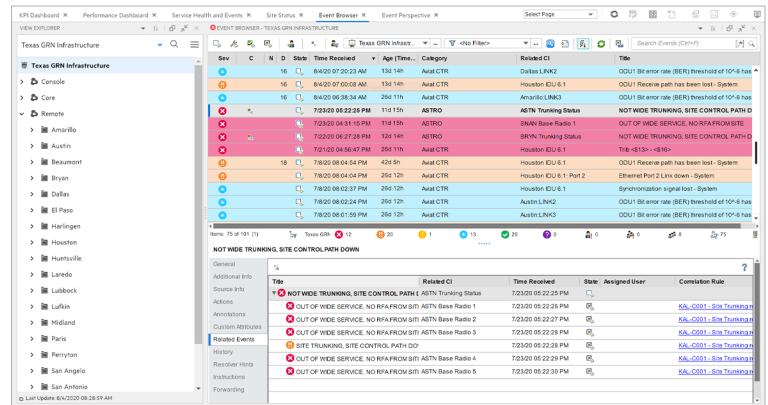


Figure 4: OBM Event Browser with Event Correlation and Symptomatic Events

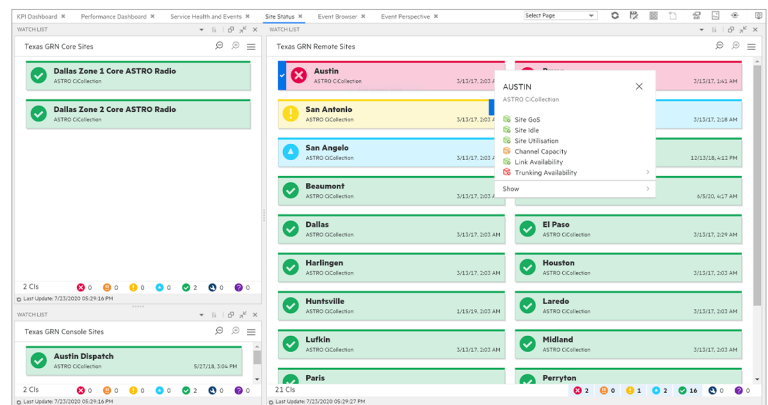


Figure 5a: OBM Site Status - ASTN

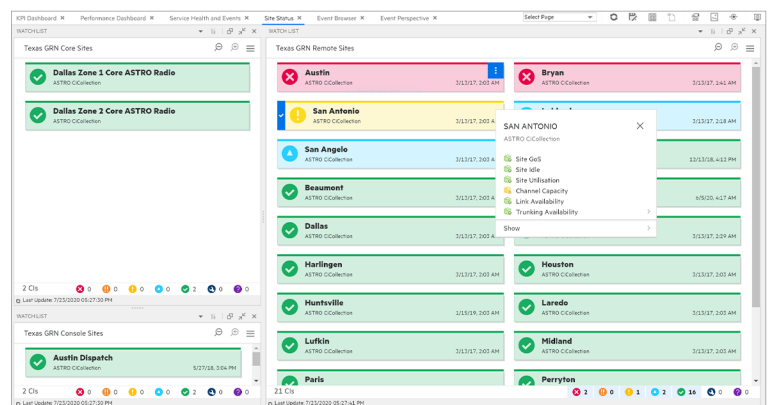


Figure 5b: OBM Site Status - SNAN



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## TRACK A SITE'S KEY PERFORMANCE INDICATORS OVER TIME

KPIs for a site are tracked overtime within the KPI Dashboard (KPI-D). The KPI-D, **Figure 6**, includes a heat chart for the various KPIs that are being monitored, and measures their availability within a timeframe set by the System Administrator. The timeframe of the heat chart can be changed to the day, week or month. Each cell is represented by either a green, red or yellow color indicative of the status of that KPI at that particular day and time. Selecting the cell will provide additional detail on the site's event history in chronological order. This could, for example, give insight to a System Administrator if a piece of equipment, which has continuously been failing, may need to be replaced.

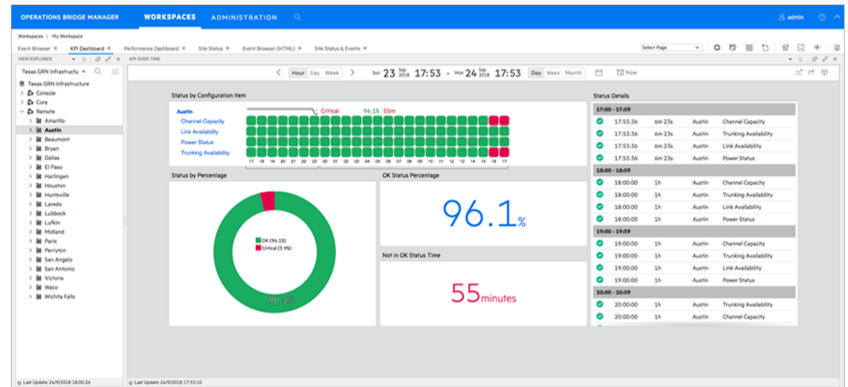


Figure 6: Key Performance Indicator Dashboard

## OPERATIONS BRIDGE DASHBOARD PROVIDES A HIGH-LEVEL VIEW OF THE OVERALL NETWORK

The Operations Bridge Dashboard (OBD) combines the GenWatch ATIA performance data with the OB data and presents a high-level view of what is going on in the network in real-time and where there may be any impacts to services or coverage. There is both a geographical and KPI element to the OBD.

The geographic part of the OBD (**Figure 7**) does not look at events. Instead, it looks at every site on the network, where the site is located and its respective status or health. Each site is color coded based on the current severity.

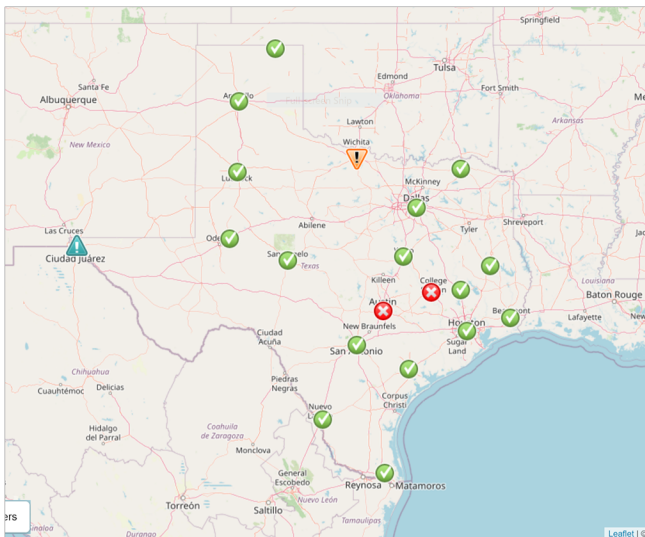


Figure 7: Geographic Display

Clicking on any site on the map will bring up the current high-level details (**Figure 8**) or KPI metrics of that particular site. Any of the metrics can be customized based on what a user wants to or has permission to see. The screen also displays how each KPI has been performing over the past 24 hours using a heat chart similar to the one used within the OBM's Site Status. To ensure it is clear what is being measured, each KPI has an "info tooltip" (blue "i") in the upper right-hand corner of the KPI box.

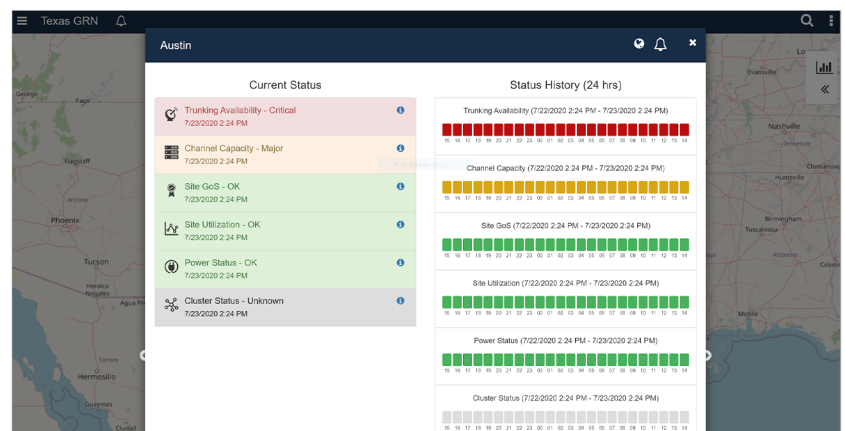


Figure 8: Key Performance Indicator Dashboard



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## MONITOR COVERAGE FOR THE ENTIRE NETWORK

One of the controls, located at the bottom left-hand side of the map, is a Layers Control. This is where a System Administrator has the ability to enable other map layers that have been integrated, such as weather and coverage. The Coverage Layer (**Figure 9**) displays coverage for each site from a Mobile or Portable perspective. The OB software takes all of the received coverage plots and renders a coverage map for the entire network. If for some reason a site were to fail, the coverage around that site would turn red, otherwise it would remain green (good).

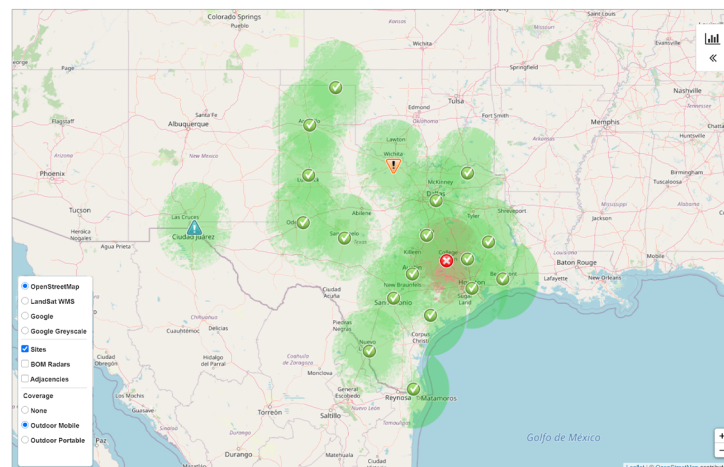


Figure 9: Coverage Layer

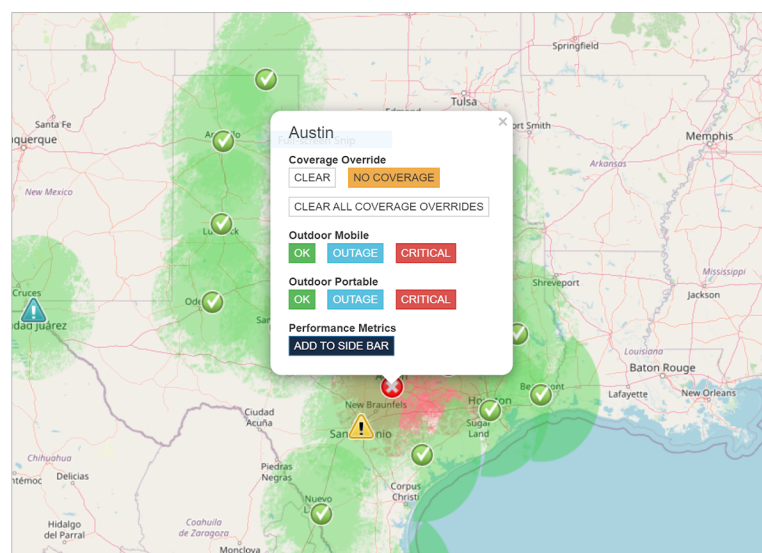


Figure 10: Coverage Simulation

There is also an option to simulate the impact to coverage if, for example, there was planned maintenance at that site. A System Administrator can right click on the site icon and select OUTAGE (**Figure 10**). The coverage color for that site would change to blue. This information may be used to notify users in the area that they may experience communication issues during the downtime. The same simulation helps a System Administrator verify loss of coverage if an adjacent site were to fail as well.

## IDENTIFY HOW SITE METRICS ARE PERFORMING IN REAL-TIME

The top right-hand area of the map has a slide bar that displays performance metrics (eg. Site Utilization, Affiliations, Grade of Service) for each site in the system (**Figure 11**). Each metric includes a bullet chart which provides information on the current value (colored bar) and the high water mark for the previous 24 hours (gray bar). The black marker indicates what is typically seen at that time/day of the week. To dive even deeper into what may be occurring, a hyperlink to the site is provided.

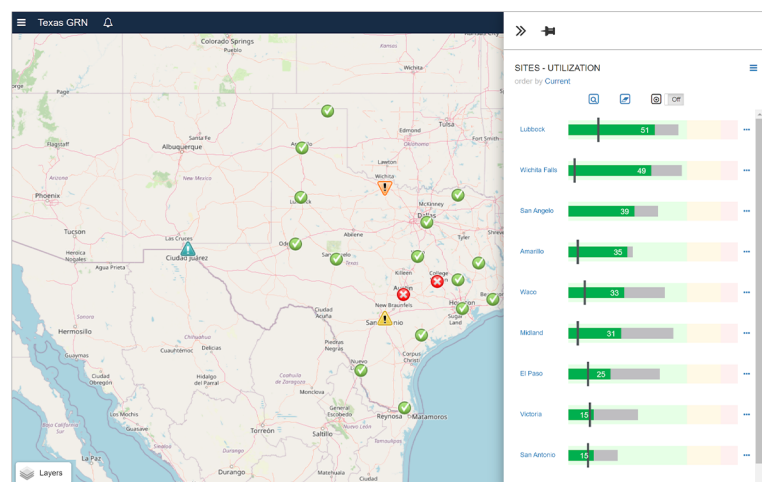


Figure 11: Performance Metrics

**Figure 12** shows the performance metrics for a specific site when the hyperlink has been selected. With the exception of Site Utilization, all other line items can be agency filtered. Any of metrics that also include a chart icon will display, in near real-time, a 7-day snapshot intended to provide a comparison to normal operation and answer some quick performance questions (**Figure 13**).

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## SYSTEM SUMMARY PROVIDES A SNAPSHOT OF NETWORK PERFORMANCE

The System Summary screen, **Figure 14**, provides a snapshot of how the whole system is performing and is broken out into three separate sections. The first, System Health and down, looks at the health of the system from both a performance and fault perspective and includes similar KPIs to what is shown at the site level. The color-coding for each KPI represents the worst severity of all sites within the system. Clicking on an individual tile will show the site(s) that are impacted, when it was impacted, the current severity level for each site and a hyperlink to the site to review the same metrics described in **Figure 12**.

Moving down, the software is tracking any current congestion anywhere on the network. Each cell has a hamburger menu in the upper right-hand corner which has a drop down list of additional metrics (eg. Busy Calls, Emergency Calls or Alarms). The lower part of the cell will include a bullet chart to provide some context over what has occurred within the past 24 hours. To identify what may have contributed to the congestion, System Administrators can review, in the third section, a “Top 10 List”, and determine what sites are currently experiencing any congestion or have, again, over the past 24 hours.

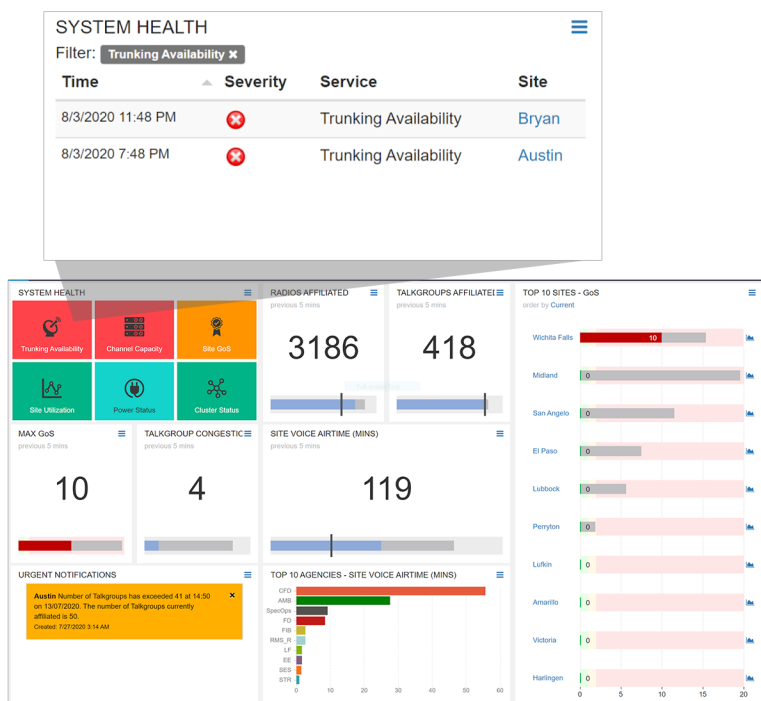


Figure 14: System Summary



Figure 12: Site Performance

Figure 13: Historical View

The summary page also includes an Urgent Notifications panel to inform others of important news whether critical or not. The greater the severity the more precedence the notice will have. This is a good way to reduce the number of calls inquiring why, for example, a site went down due to planned maintenance. Notices are either automatically shown based on a set of rules, or manually added by users with certain permissions.

The second section displays affiliation and both site and system-wide voice airtime statistics; each of which can be filtered by agency. Bullet charts are included to give the System Administrator some background regarding performance over time. A “Top 10 List” will display an allocation of airtime across all agencies to determine the most active users.

## OPERATIONS BRIDGE CAN ESCALATE EVENTS TO A NOTIFICATION SYSTEM

Based on impacts to the Real-Time Service Model (RTSM), the OB is able to trigger additional actions. When those predefined events occur, a notification is created and is able to be sent via email, text message, or escalated north to a work order or other notification system. Specific to work orders, these notifications are bidirectional. Events are assigned a Work Order ID based on a set of rules. These IDs can be automatically or manually generated. As each incident is cleared, the resolution time is then added to the Work Order saving the System Administrator from having to take that extra step.

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By utilizing the GenWatch UEM, the Motorola UEM data can be filtered prior to the events and alarms being sent to the OB to ensure that the most critical information is being passed on without all of the noise. All remaining infrastructure, such as microwave backhaul, voice loggers, data servers, routers and switches are reported with a direct connection to the device's element manager. If the device does not have an element manager, the OB is able to connect to the device or device's server directly.

From there this information is sorted, stored, and correlated into a central location, the Operations Bridge Manager (OBM) for intelligent monitoring, management, and reporting. A System Administrator is also able to elect to have this information integrated with a work order and/or notification system. Since the OB is a browser-delivered solution, it is capable of being deployed on the internet or on an intranet, allowing flexibility with IT set up and access. A System Administrator may create and distribute secure user log-ins and restrict permissions to specific elements of the solution. Two-factor Authentication can be integrated with systems such as RSA Secure ID and Duo.

## OPERATIONS BRIDGE INTERFACES WITH A BROAD RANGE OF NETWORKS

The OB solution supports a broad range of network infrastructure out-of-the-box. A current list of these devices can be found on the [Genesis Website](#). From a software perspective, the solution comes enabled with the ability to auto discover and status poll devices (e.g., environmental), as well as process event policies for faults generated by these devices, metric collection, thresholding, charting and reporting. This built in functionality saves System Administrators significant time and effort from having to perform those actions on their own.

## SYSTEM ADMINISTRATORS ARE EMPOWERED TO MANAGE NETWORK GROWTH

Another major benefit of the OB is the amount of empowerment that is handed over to a System Administrator during the initial deployment. The software is designed in a way that allows for ongoing modifications as networks grow or for general day to day operations. For example, as new infrastructure is added, the software will auto discover the device(s) based on multiple factors (e.g., IP address, site, zone) and add it to the OB Configuration Management Database (CMDB).

Extensive training is also provided to System Administrators on both how to use and administer the software. Part of that training includes the ability to make necessary event processing rule changes directly in the OB web interface, such as event correlation or the severity levels that are assigned to a particular event.

## OPERATIONS BRIDGE IS NOT A "ONE SIZE FITS ALL" SOLUTION

GenWatch ATIA with GenWatch UEM are prerequisites to the OB and must be deployed first. These software licenses are perpetual and licensed by the zone. Prior to installing and using GenWatch ATIA and GenWatch UEM, Motorola will need to license the Flexible ATIA on all zone ATRs and the CEN(s) must be configured to send ATIA data. The Northbound Interface (NBI) will also need to be enabled.

The OB is licensed based on the number of individual devices being monitored and the size of the network (e.g., number of channels, radio sites, console sites). It is not a "one size fits all" solution, therefore a simple questionnaire will need to be completed in order to determine the right size of the network and appropriate licensing is quoted. A [Genesis Sales Representative](#) can supply the questionnaire and assist with that process.

The hardware for the OB to operate may be purchased through Genesis directly or sourced privately. In addition, the software may be placed on physical servers or virtualized. Because the system design has an impact on the hardware requirements, it is encouraged to reach out to the [Genesis Sales Team](#) for the current specifications.





# GENESIS OPERATIONS BRIDGE

## EXTENDED SERVICE AGREEMENT OPTIONS THAT PROTECT YOUR INVESTMENT

Genesis provides a 1-year standard warranty on all Genesis software products which begins on the date of installation (i.e., the software goes live). Beyond the standard warranty period, Genesis offers two tiers of extended support; Essential Service Agreement (ESA) and Premium Lifecycle Agreement (Lifecycle).

At a high-level, ESA's cover all things software related, while Lifecycle includes support on software, as well as hardware and third-party software (eg. Microsoft® Windows). Each executed agreement has a minimum of one year, however, multi-year agreements are also available upon request.

**Figure 15** lists the services provided with each agreement. A few of the services can be added ala carte to any ESA. For more detail, including contact information and the Genesis hardware replacement policy, please refer to the "[Genesis Service Agreement Overview](#)" document.



## CONTACT GENESIS

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💻 [genesisworld.com](http://genesisworld.com)

SERVICE PROVIDED	PREMIUM LIFECYCLE	ESSENTIAL SERVICE
Multi-year Pricing	✓	✓
Phone, Email and/or Remote In Assistance (During Regular Business Hours)	✓	✓
24/7 "On-Call" Availability for Complete Software Failure	✓	✓
Software Updates and Version Upgrades	✓	✓
Hardware Refreshes	✓	
Hardware Warranty Extensions	✓	
On-Site Services	✓	ALA CARTE
Third Party Software Replacement	✓	
Training Following Software Upgrades	✓	ALA CARTE
Quarterly Preventative Maintenance Checks (Remote Only)	✓	

Figure 15: Genesis Service Agreement Overview Matrix