# NetMotion® WIRELESS

# Locality
## Innovative Cellular Network Management Software

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# Overview

Business is run on top of complex corporate networks that have a sophisticated set of tools to provide visibility into those networks.  But today, organizations are not only relying on the corporate WAN network. Increasingly, the public cellular networks have become a key piece of the overall network infrastructure that companies depend on to transport mission critical data and applications.

The investment made in cellular deployments by businesses is significant including devices, monthly service and mobile application development.  It is often the case that these cellular networks are supporting an organization's front line field workers – those that are closest to customers and the organization's most critical assets and infrastructure.  However, unlike their wired counterparts, there are few tools available to monitor the performance of cellular data networks.  But now, that's all about to change.

Locality provides the insight and visibility needed to optimize your mobile data deployments.

# Benefits of Locality

Locality™, from NetMotion Wireless, is cellular network performance management software that gives organizations the insight and visibility needed to optimize their mobile data deployments.  Using coverage maps and detailed reports, Locality identifies the causes of poor connectivity, creates an inventory of deployed devices and monitors data usage, resulting in more productive field workers and reduced expenses.

Using Locality, you can gain:

- **Increased efficiency in managing a mobile deployment**. Increased visibility enables managers to be more effective and make informed decisions about carriers, wireless technology and devices with less effort.

- **Increased productivity in the field.** With improved network connectivity, mobile workers are more efficient, less distracted, and more productive.  More productive workers can get more done in the same amount of time, resulting in increased revenues.

- **Increased productivity for your support organization**. Fewer support calls, and real data to work with for those that do come in, means lower support costs.

- **Reduced data service plan expenses** through elimination of unused or under-used data plans.

This paper describes how Locality works, introduces the maps, reports and business intelligence that it produces, and defines the product's technical requirements.

# Architecture

Network management products for wired networks use protocols such as SNMP, JFLOW, SFLOW, and NetFlow that were designed for networks with low levels of packet loss. When high levels of packet loss are encountered, these protocols can lose information that is vital to understanding and pinpointing the causes of poor network reliability. To overcome these challenges many wired network management products require the use of a separate, dedicated management backbone to provide reliability in the event the monitored enterprise system is degraded.

Unlike wired management systems, Locality is designed specifically to manage wireless networks by using heuristic methods to gather performance metrics, even when full network connectivity is not available. Locality captures important data including received signal strength, connection status, data usage, application usage, location, and network technology as long as the cellular modem is active (it does not have to be connected).

At a regular interval, if the device is connected, the agent then compresses and transmits this data back to the Locality server via HTTPS, averaging between 12 and 24 kilobytes per hour.  If the device is not connected, then the agent will collect and store the data for a defined period of time, and will send the data opportunistically when the device has a connection using reliable store-and-forward techniques, preventing the loss of important data.

The Locality server receives the data, stores it in a database, then displays it in interactive maps and charts in the Locality console. This information is then available for deep inspection and analysis of system performance.

As an option, the Locality server can pull in data from the Mobility XE Analytics Module, which provides additional application level visibility and reporting..
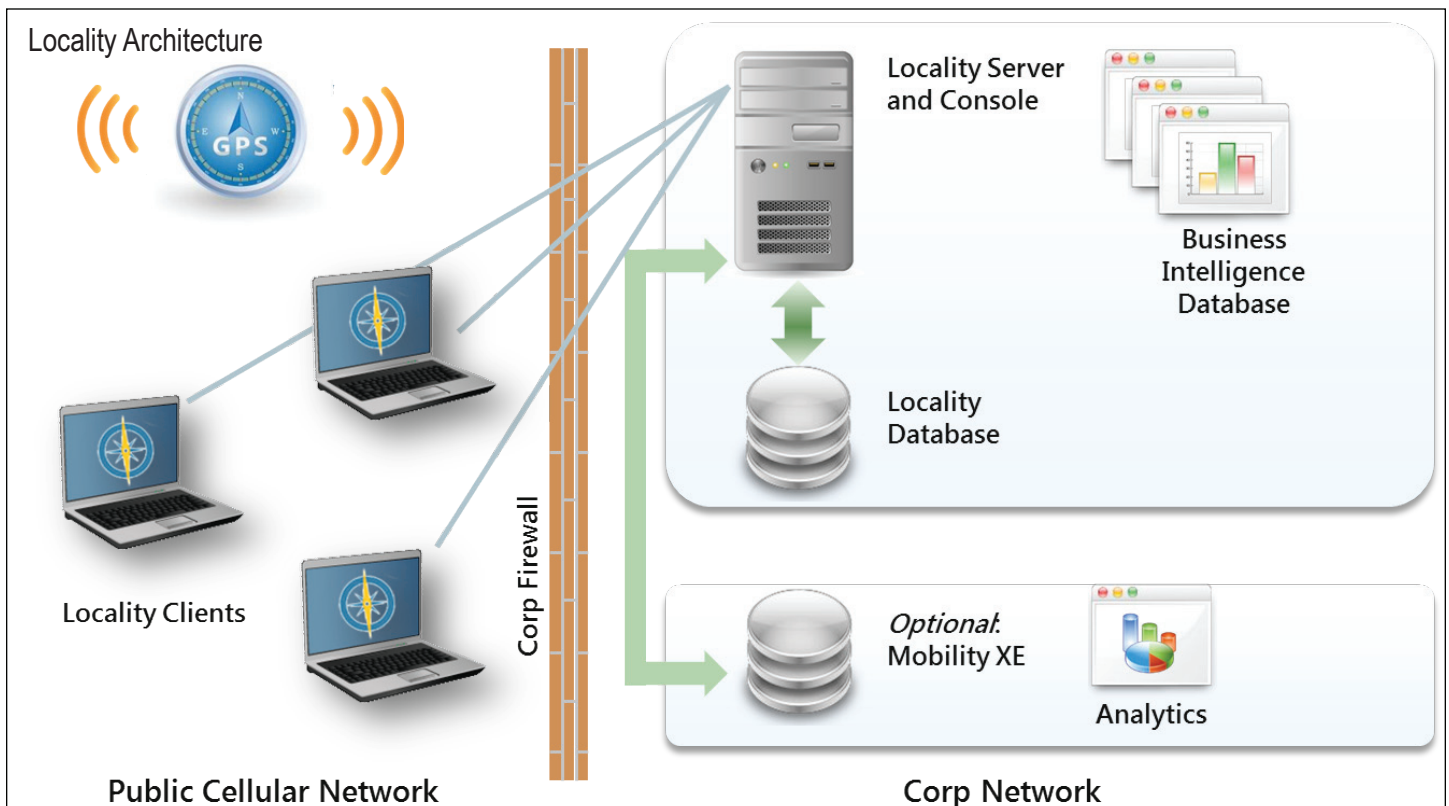
In order to generate Coverage and Device Maps, GPS must be activated and functional on the mobile devices with the Locality client. Locality is able to gather location information without disrupting existing applications such as dispatch and vehicle tracking, which may also be querying the GPS receiver.

Locality supports two categories of GPS receivers:

• An external GPS receiver connected via serial or USB

• A carrier network adapter containing an integrated GPS receiver

Locality supports those GPS devices that communicate to the mobile device via NMEA or TAIP communications protocols, and are supported both by the device manufacturer and the cellular carrier. For more detail on the GPS receivers supported by Locality, please see the Deploying Locality section of this paper, or visit:
**http://www.NetMotionWireless.com/Locality/Requirements**

If the GPS receiver is unavailable, all of the non-location performance information is still collected and included in Locality's business intelligence reports.

# Locality Maps and Reports

Locality provides visibility into cellular network performance via a coordinated set of maps and reports. Mapping features show network performance and connectivity metrics corresponding to the locations of mobile workers over time. Reports provide critical insights and answers about a mobile deployment.

**Locality includes the following categories of maps and reports:**

| Category | Description |
|---|---|
| **Network Performance** | Access a comprehensive view of your overall cellular network performance, including coverage, signal strength, technology and utilization information. See where poor signal strength, older network technologies or dropped connections may be having an impact on mobile worker productivity. |
| **Network Usage** | Understand your overall cellular network usage. Analyze your employees' data usage, by carrier, user or application. |
| **Dropped Connections** | Monitor cellular connectivity problems with detailed information on dropped connections for all of your users. |
| **Inventory** | Comprehensive, real-time view of your cellular network adapters and firmware. |

# Network Performance

The Network Performance tab gives you all the tools you need to truly understand how your cellular data network is performing. These include:

• Coverage Map

• Device Map

• Technology Availability Report

• Technology Trends Report

• Technology Adapters Report

• Mobility XE Compression Report

## Coverage Map

Using data collected from your mobile devices, Locality allows you to see aggregated network coverage statistics for each of your carriers, including signal strength and available technology.

You can use these maps to:

• Analyze network signal strength and technology type in areas used by your workers.

• Compare differences in coverage, signal strength and technology generation by carrier.

• Proactively identify areas where coverage is unavailable or consistently of poor quality
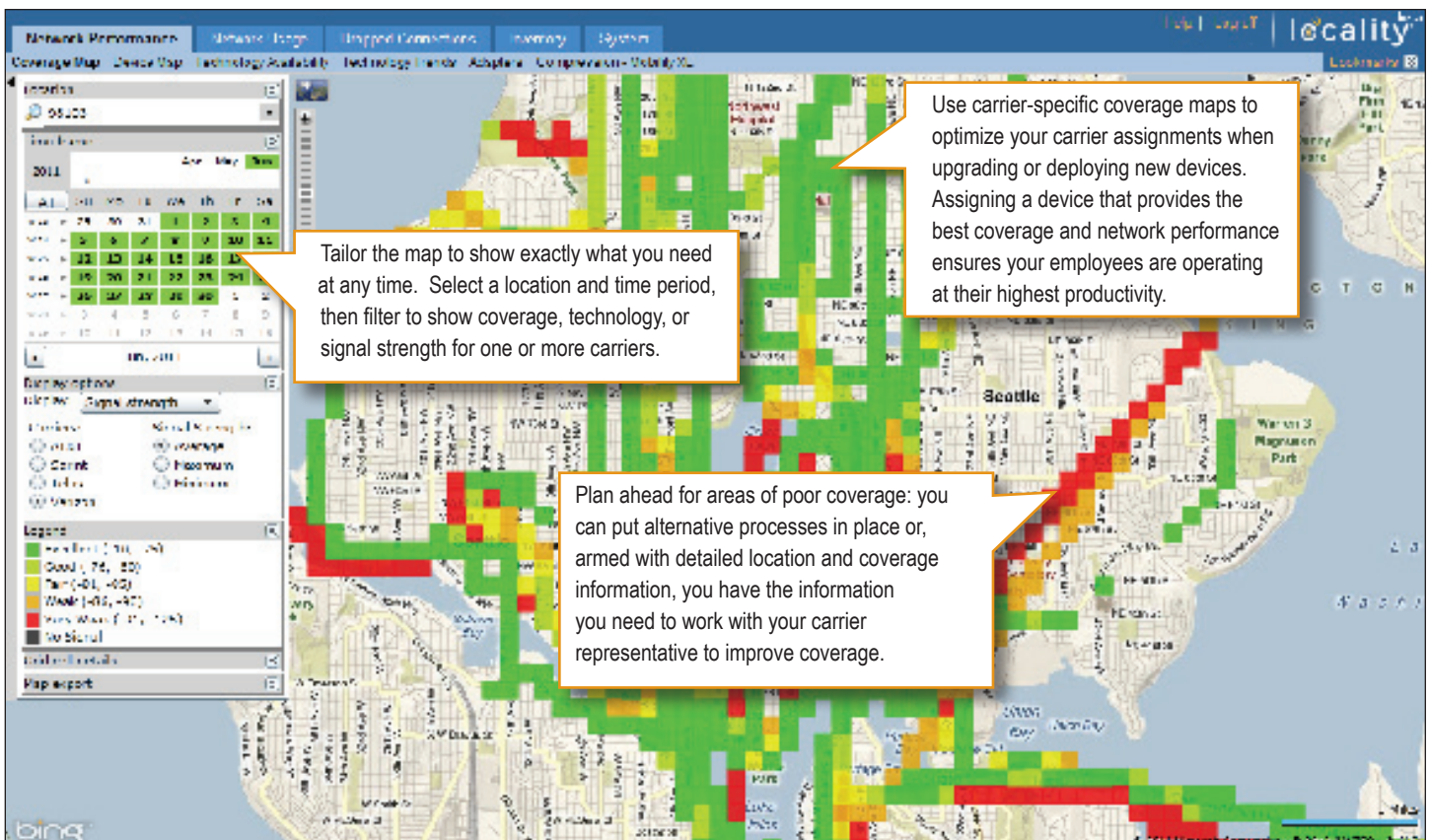
## Device Map

Track minute by minute usage of individual devices, and see where poor signal strength, slower network technologies, and dropped connections have occurred.



Select a date and time period, and review exactly what the device was experiencing. Monitor drops and connections, signal strength, and technology availability.

Users are not always able to contact the support desk when they are experiencing connectivity problems. The device report lets you recreate what the user was experiencing, after the fact. Use the report to identify what factors are contributing to poor performance – poor coverage, congestion, or mobile equipment problems (such as antennas, cables, or adapters).

## Technology Availability Report

See data usage and trends by network technology generation. Monitor how each user is utilizing the various technologies. View information by phone number, device name, user name, or carrier.
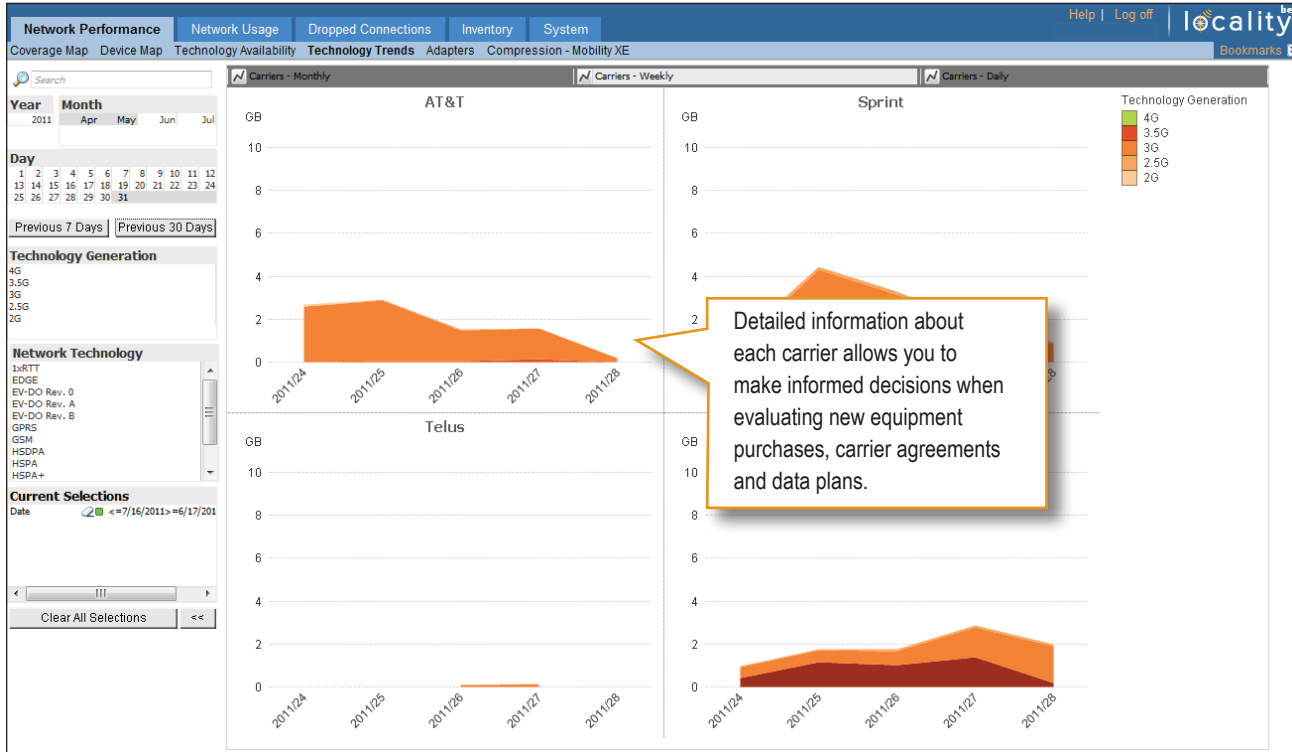


Understand how carrier network upgrades or expansions are progressing, and monitor trends in technology availability as a measure of network health and performance.

Identify devices with significant data usage through slower technologies and investigate to determine if there are connection or coverage problems or if the user should be upgraded to a newer device.

# Technology Trends Report

Compare utilization of various network technologies across carriers.



Detailed information about each carrier allows you to make informed decisions when evaluating new equipment purchases, carrier agreements and data plans.

# Adapters Report

View what technology is being used by each adapter, and identify adapters associated with slower network technologies.



Identify adapters still accessing slower networks, and make informed decisions about when to upgrade.
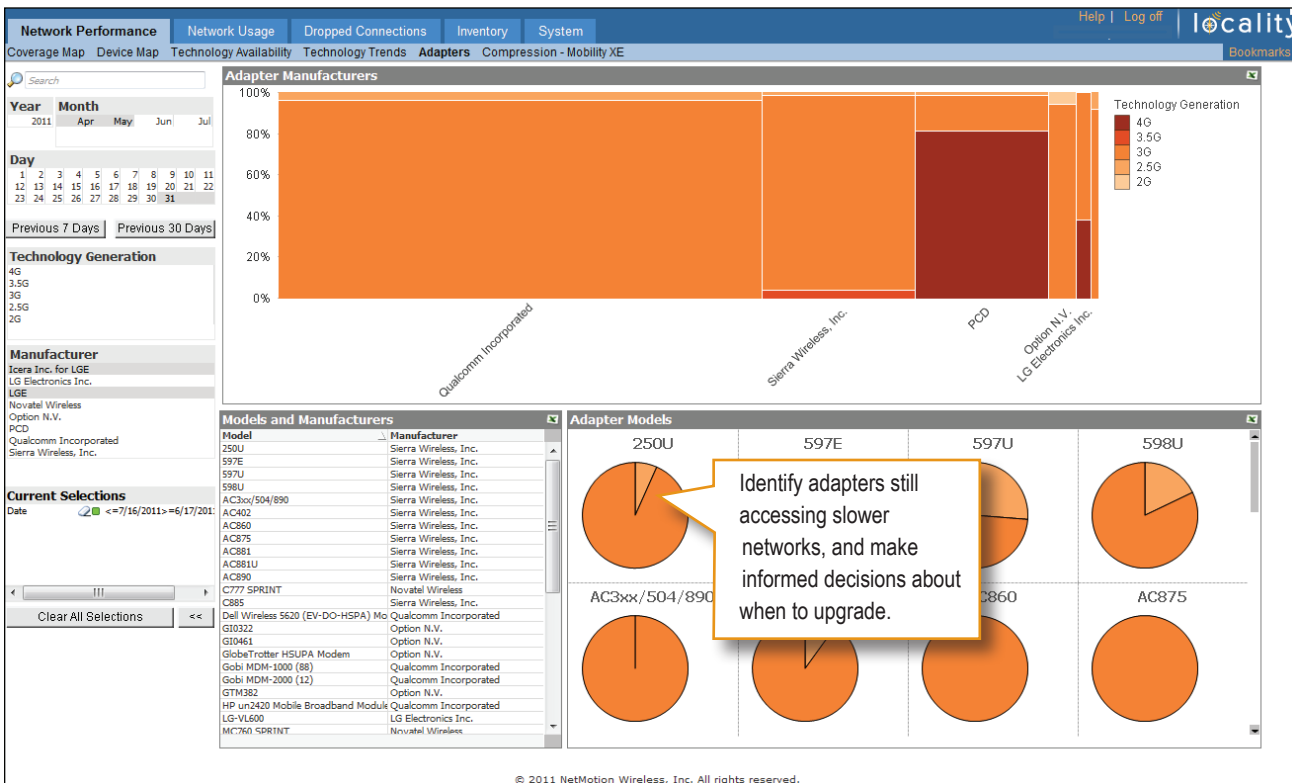
# Mobility Compression Report*

Get at-a-glance information about the data savings achieved using Mobility XE data compression.   Use detailed reporting to quantify the data plan cost savings resulting from your Mobility XE deployment.
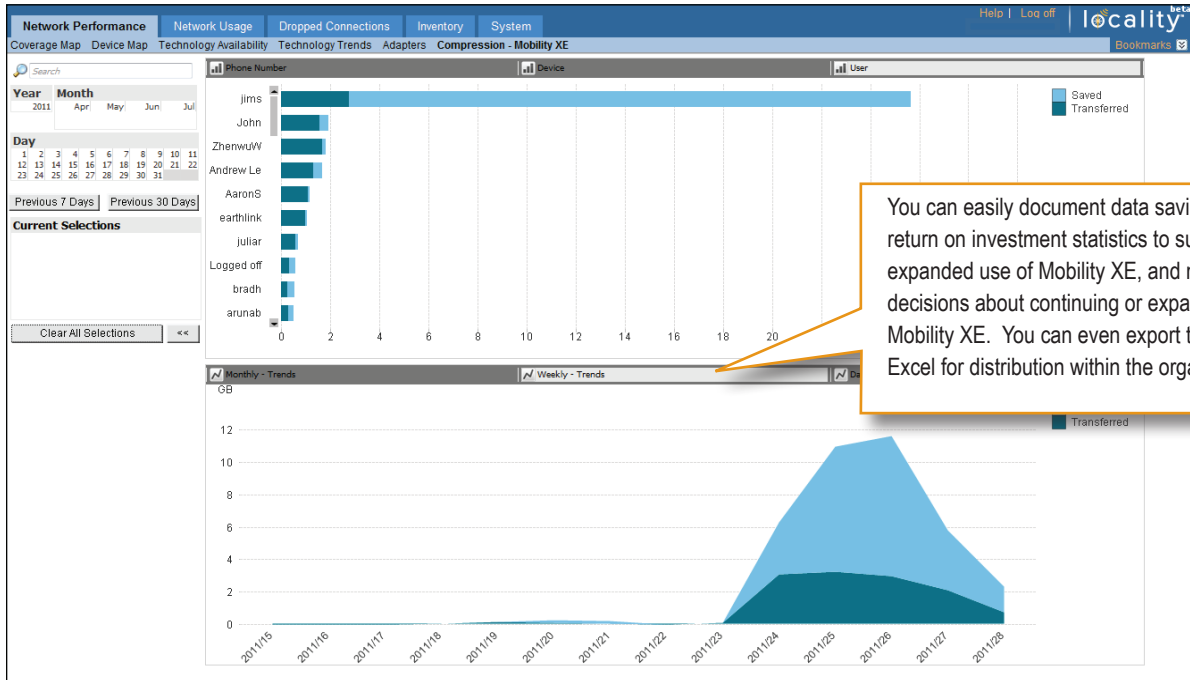


*\* This report is only available to customers with mobile deployments using the Mobility XE Analytics Module.*
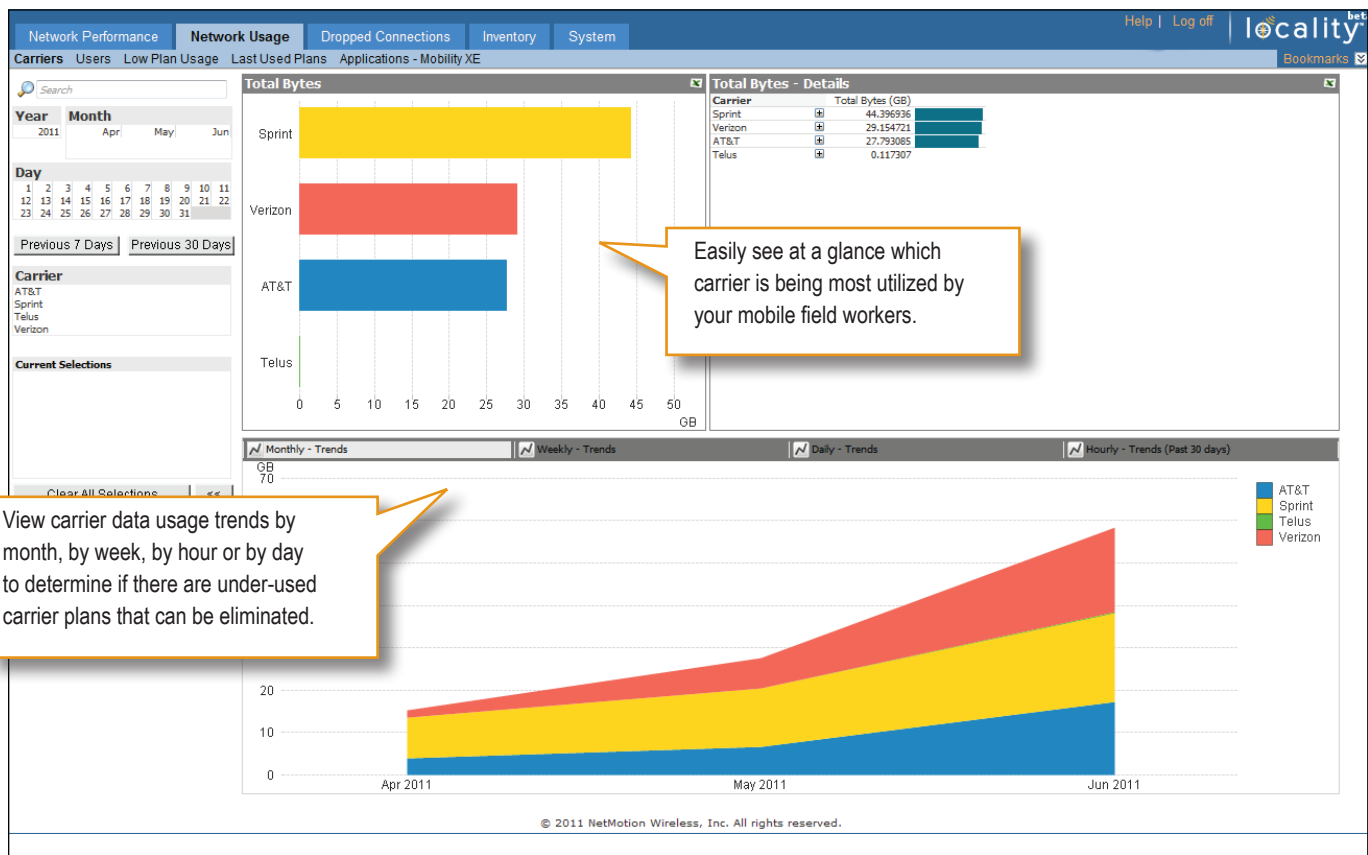
# Network Usage Reports

The next suite of reports can be used to analyze data usage by carrier, by user, and by application. Using usage reports it is easy to identify unused and under-utilized mobile devices, allowing you to cancel or redeploy these lines of service.

These reports include:

• Carriers Report

• Users Report

• Low Plan Usage Report

• Last Used Plans Report

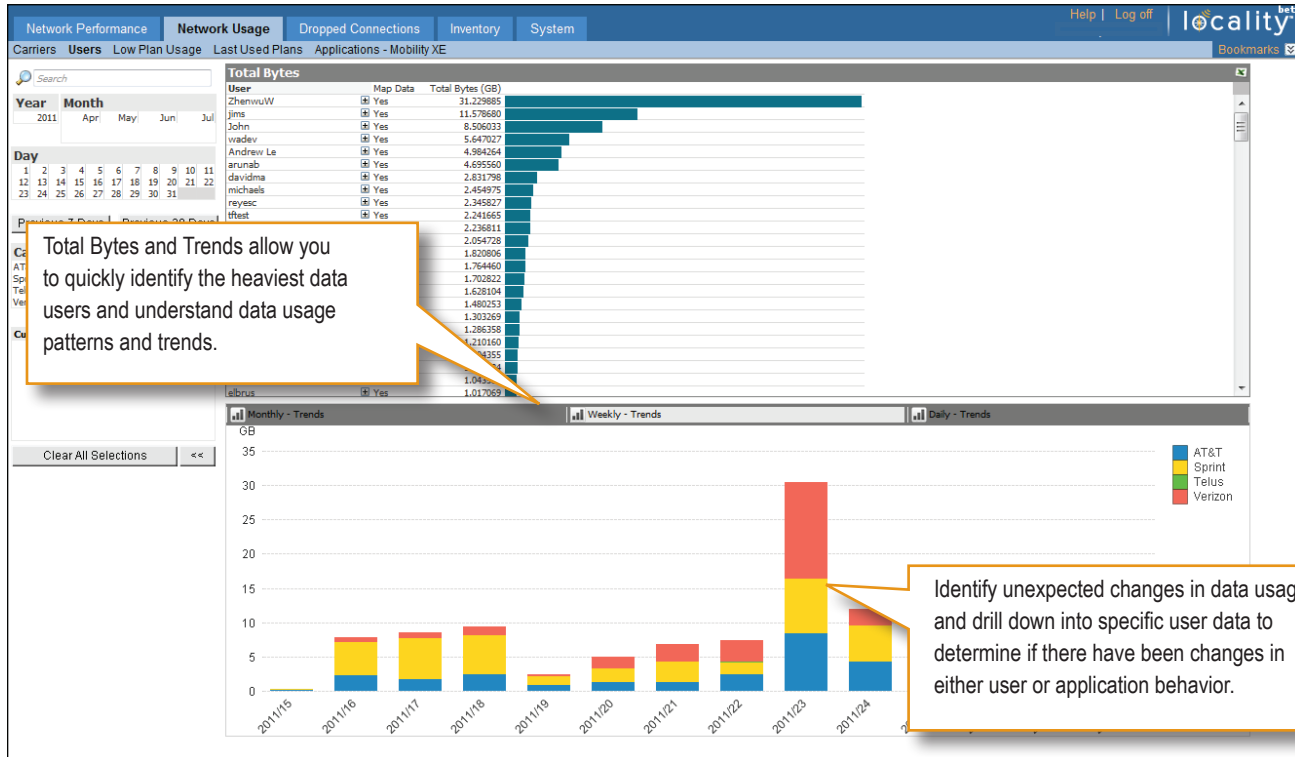• Applications Report (requires Mobility XE with the Analytics Module)

## Carriers Report

See data usage trends for each carrier to easily compare the amount of traffic being sent across each network.
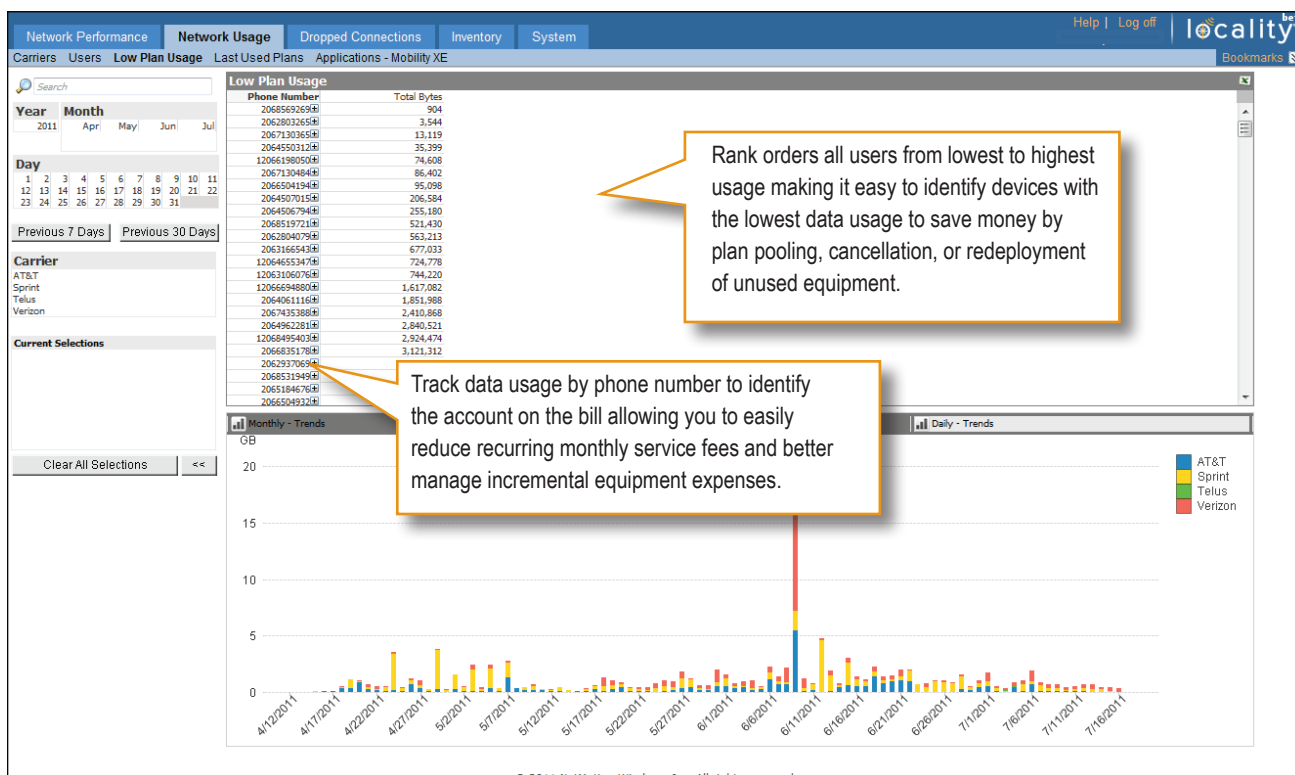
## Users Report

Utilize this report to see data usage and trends for each user, device, phone number, and carrier.
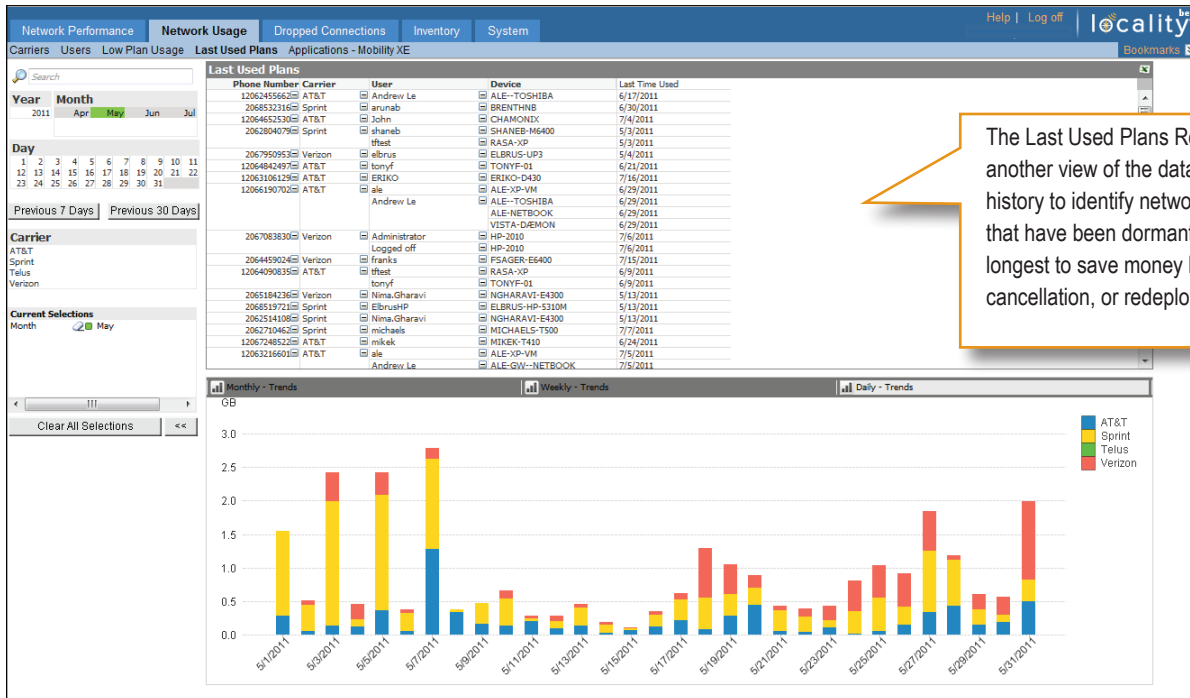


Total Bytes and Trends allow you to quickly identify the heaviest data users and understand data usage patterns and trends.

Identify unexpected changes in data usage and drill down into specific user data to determine if there have been changes in either user or application behavior.

## Low Plan Usage Report

This report shows the phone number and carrier of the cellular network adapters with the least amount of data usage.



Rank orders all users from lowest to highest usage making it easy to identify devices with the lowest data usage to save money by plan pooling, cancellation, or redeployment of unused equipment.

Track data usage by phone number to identify the account on the bill allowing you to easily reduce recurring monthly service fees and better manage incremental equipment expenses.
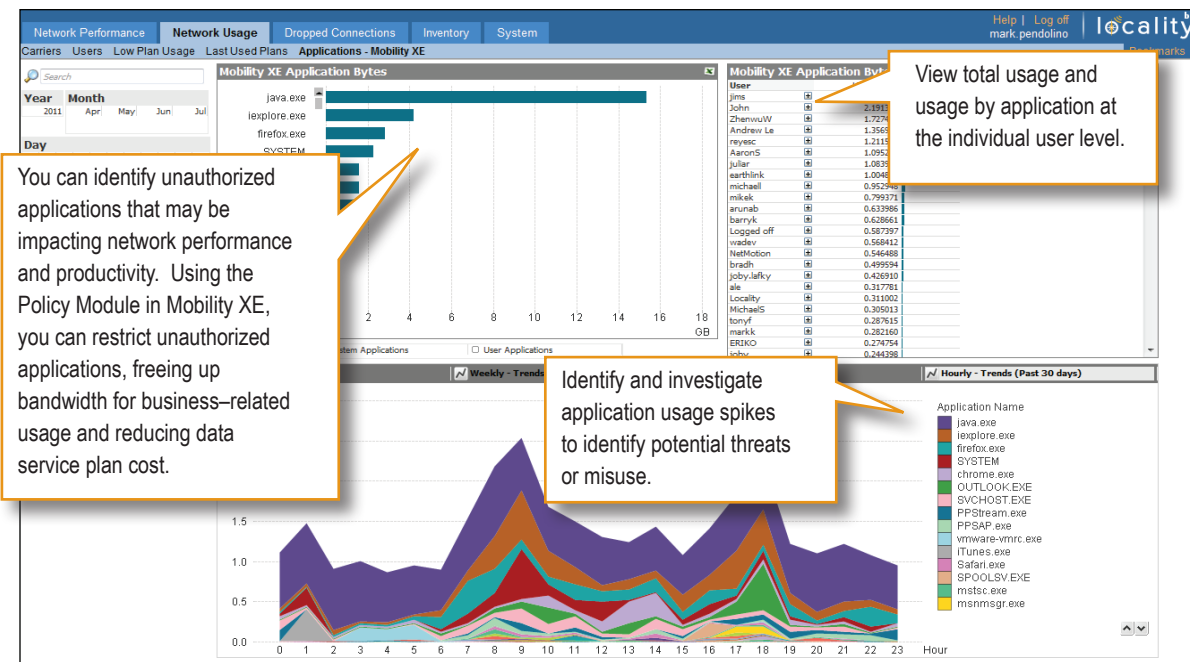
# Last Used Plans Report

Locality gives you the ability to view your data through many different filters. Identify when cellular network adapters were last used to make sure that you are not cancelling needed lines of service.



The Last Used Plans Report takes another view of the data usage history to identify network adapters that have been dormant the longest to save money by pooling, cancellation, or redeployment.

# Applications Report*

The Applications Report provides detailed data consumption by application, user, device, and phone number. You can use this report to monitor what applications are consuming the most bandwidth, trends in application use over time, and unexpected usage patterns that may be indicative of malicious applications, viruses, or worms.

*This report is available to customers using Locality in conjunction with the Mobility XE Analytics Module.*



You can identify unauthorized applications that may be impacting network performance and productivity. Using the Policy Module in Mobility XE, you can restrict unauthorized applications, freeing up bandwidth for business–related usage and reducing data service plan cost.

Identify and investigate application usage spikes to identify potential threats or misuse.

View total usage and usage by application at the individual user level.
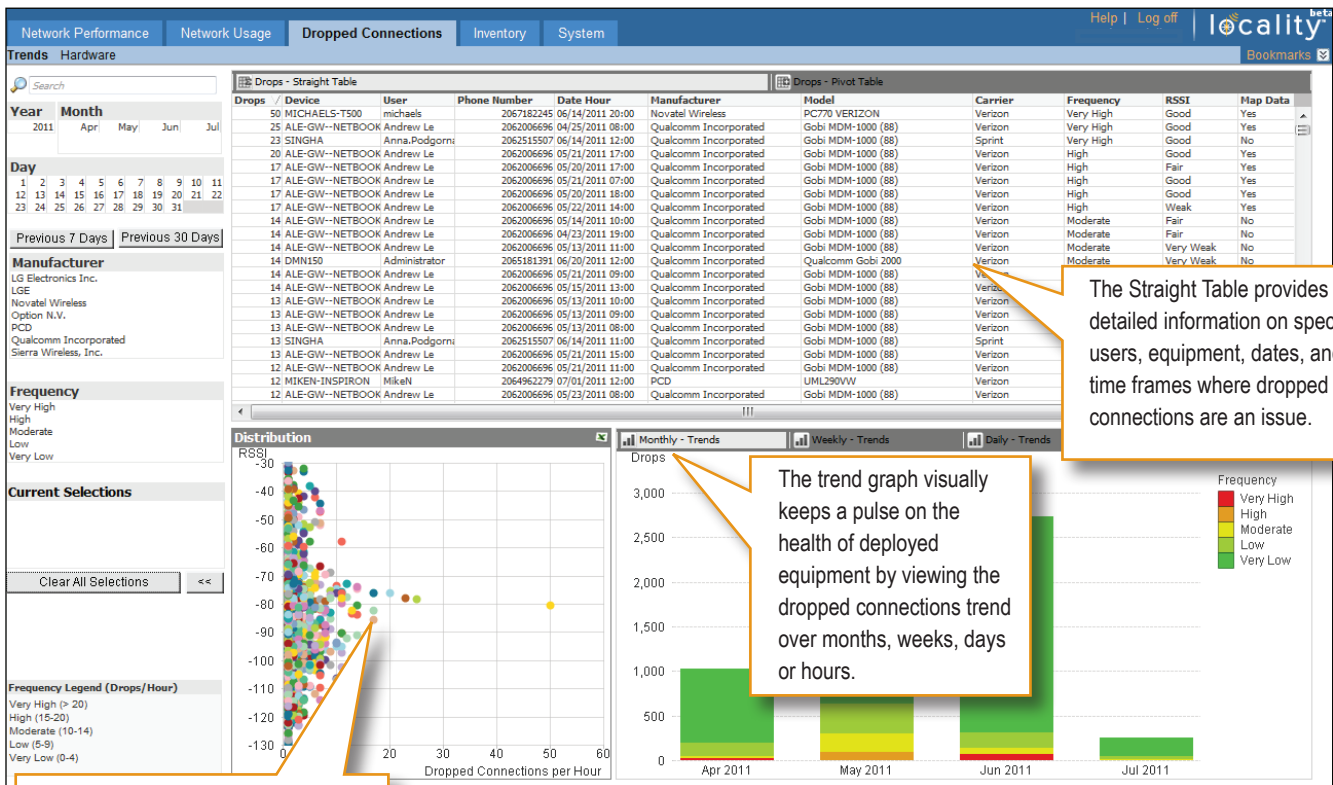
# Dropped Connection Reports

Provides the number of times a device has been disconnected in any 60 minute period of time. A disconnection could be caused by inadequate coverage, or by a mobile field worker disconnecting the modem. A large number of disconnections in a given hour when the device is reporting a strong RSSI indicates that there is a device problem.

There are two types of reports in this category:

• Trends Report

• Hardware Report

## Trends Report

Provides visibility into the severity and frequency of dropped connections per hour by device, adapter configuration, carrier, and signal strength. Begin your troubleshooting with factual information about actual device performance.



The Straight Table provides the detailed information on specific users, equipment, dates, and time frames where dropped connections are an issue.

The trend graph visually keeps a pulse on the health of deployed equipment by viewing the dropped connections trend over months, weeks, days or hours.

Distribution shows you where devices show up that are in adequate coverage but are still experiencing a high number of dropped connections. Zoom in on these devices to understand exactly which mobile field workers are having connectivity issues.

# Hardware Report

See the frequency of dropped connections by adapter manufacturer, model, and firmware revision.



Manufacturer Distribution Graphs let you identify dropped connections by adapter manufacturer, model, and firmware revision.

Manufacturer Details: drill down by manufacturer and model to identify if certain adapter models or firmware versions experience disproportionately more dropped connections.
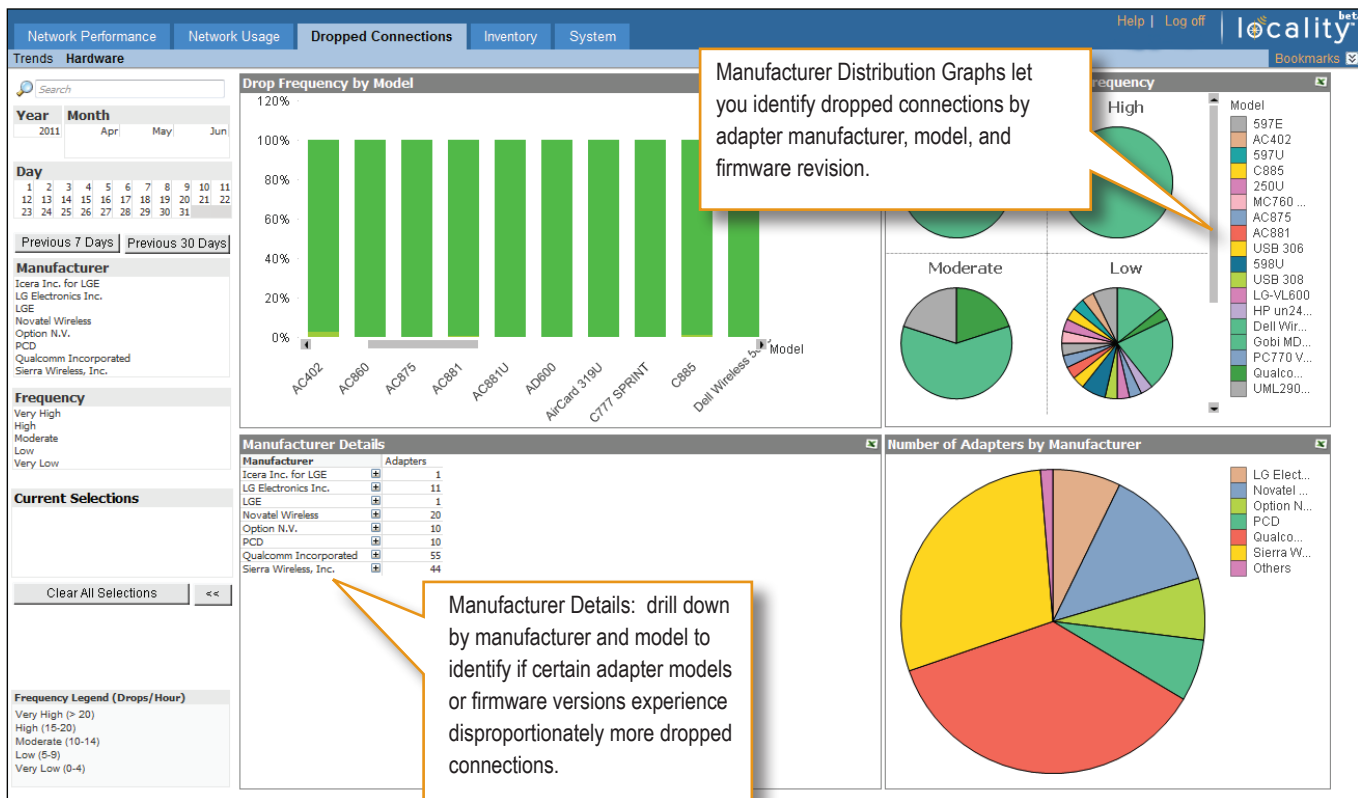
# Inventory Reports

Ensure your equipment is always up-to-date and avoid unnecessary equipment expenses by using the Locality Inventory reports. These reports provide a comprehensive overview of your hardware, and correlates your hardware to key account and service information. The inventory reports include:

• Population Report

• Configuration Report

## Population Report

This report provides inventory information for all adapters, including carrier, adapter manufacturer, model, and firmware revision. You can use this report to obtain an accurate and up-to-date list of all devices and actual adapter configurations.
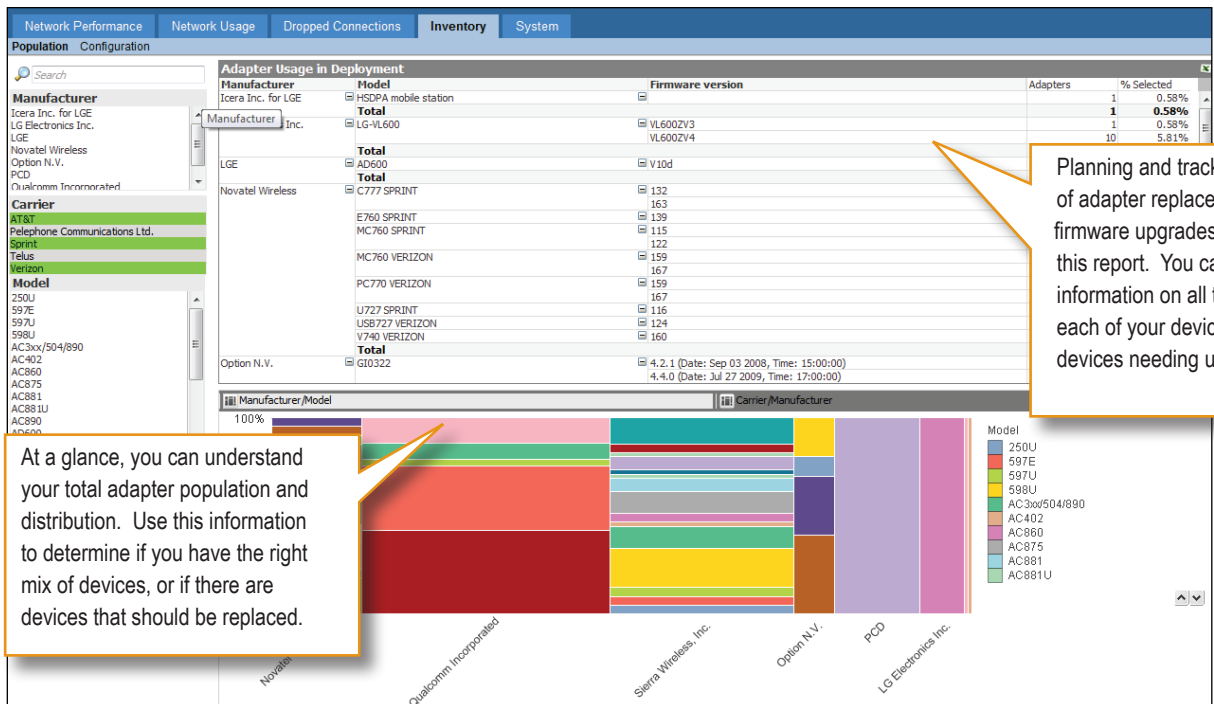


Planning and tracking the progress of adapter replacements or firmware upgrades is easy with this report. You can see real-time information on all the details of each of your devices, and identify devices needing upgrades.

At a glance, you can understand your total adapter population and distribution. Use this information to determine if you have the right mix of devices, or if there are devices that should be replaced.

# Configuration Report

In addition to providing inventory information for each adapter, the configuration report also includes key service information, including phone number, carrier, device, user, last-used date, IMEI, ESN and MEI. Detailed information linking equipment and users can help you control costs and monitor equipment usage.



You can use this report to identify the service line for deactivation when a device is reported lost or stolen.

If an adapter is in need of replacement or upgrade, this report allows you to easily identify the current user account and contact them for device maintenance.

Easily match up the network adapter phone number with ESN, IMEI, MEI, and see the last person using it, as well as the last date it was used.

# Deploying Locality

Locality is easy to deploy, with minimal capital or resource investment required. A wizard-based installation makes Locality easy to deploy.  It is built on the Windows platform and requires only one server, making the resource cost to deploy very low.  It is invisible to the end user and leverages existing investments in mobile devices and GPS.  No new end user hardware or training is required.  Locality also works with all VPN solutions.

## Technical Requirements

Locality will continue to expand the list of supported operating systems and modem adapters over time. For the latest in technical requirements and product updates, please visit:

**http://www.NetMotionWireless.com/Locality/Requirements**

NetMotion Wireless plans to test and support all of the leading cellular network providers, adapters, connection managers and GPS devices for operation with Locality.  NetMotion Wireless will support leading NMEA or TAIP compatible GPS devices, including those integrated within tested network adapters.  NetMotion Wireless will only support embedded GPS receivers if they are supported by the carrier, the adapter manufacturer and the laptop/netbook manufacturer.

In order to assist our customers in their strategic planning, NetMotion Wireless adheres to the following procedures:

1.  NetMotion Wireless will maintain a current list of tested cellular network providers, adapters, connection managers and GPS devices on our website.

2.  When an adapter or GPS device is discontinued by the carrier or vendor we will, to the best of our ability, continue to test and ensure future versions of Locality agents operate with these devices until the carrier or manufacturer stops supporting them.

The interactions between cellular network adapters, connection managers and Locality agents are complex.  Some connection managers automatically receive and install firmware updates that may be incompatible with Locality. NetMotion Wireless will make effort to address incompatibilities between Locality and listed adapters and connection managers as they are discovered.

### Locality Server Requirements

You must install all Locality server components on a single machine. In general, servers with additional processors or faster processors will support greater activity by a larger number of users. For more information on the Locality server requirements, visit:

**http://www.NetMotionWireless.com/Locality/Requirements**

### Learn More

For more information about NetMotion Wireless and Locality, please visit:

**http://www.NetMotionWireless.com/Locality**