

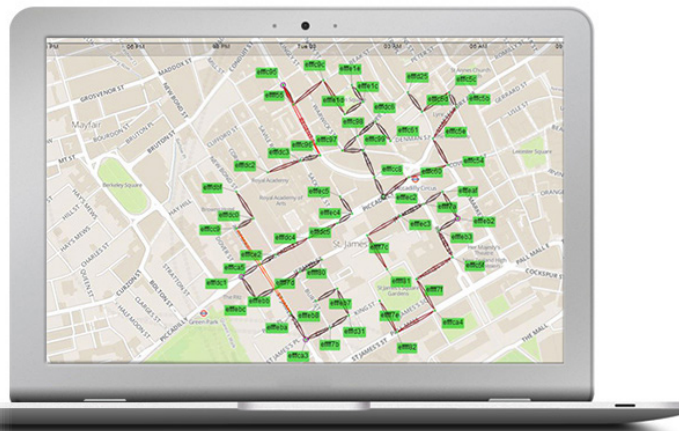
## Metnet EMS Product Datasheet

CCS Element Management System (EMS) allows customers to plan, monitor and manage CCS networks.

Metnet EMS provides simple topology views to allow you to visualise the self-organising, multipoint access and backhaul network. The EMS also provides real-time and historical performance monitoring to aid fault-finding and troubleshooting. A planning mode allows operators to effectively design and optimise the Metnet backhaul network. The EMS provides northbound fault management for integration into operators' fault monitoring systems, along with northbound exporting of performance management data in industry-standard formats.

The EMS includes standard features such as remote configuration management, fault reporting and alarming, remote software download and upgrade, and configuration upload.

The EMS server software runs on Linux 64bit operating systems to ensure carrier class availability using cost effective platforms. The EMS client is java scripted based and can be launched from a standard web browser running on any laptop or mobile device.



### Technical Specifications

<b>Planning/Design</b>	<ul style="list-style-type: none"> <li>• Simulates CCS SON and scheduling based on node locations and capacity requirements</li> <li>• Link budget calculations using ITU-R 837-6 precipitation data</li> <li>• Import 3D building data for accurate LOS calculations</li> <li>• Optimise network capacity and simulate failure scenarios</li> <li>• Greenfield and network expansion planning</li> </ul>
<b>Fault Management</b>	<ul style="list-style-type: none"> <li>• Active and historic alarms</li> <li>• Filter function</li> <li>• Export to CSV</li> <li>• Configurable alarms</li> <li>• Configurable thresholds</li> <li>• SNMP northbound interface</li> </ul>
<b>Configuration Management</b>	<ul style="list-style-type: none"> <li>• Network and capacity planning using integrated module</li> <li>• Remote node configuration</li> <li>• Northbound interface</li> <li>• REST API</li> </ul>
<b>Administration Management</b>	<ul style="list-style-type: none"> <li>• Backup and restore functions</li> <li>• Active/standby redundancy</li> <li>• Remote SW/FW upgrades</li> <li>• User account management</li> <li>• LDAP, RADIUS authentication</li> </ul>
<b>Performance Management</b>	<ul style="list-style-type: none"> <li>• Historic performance monitoring for sites and links</li> <li>• 5 min, 1 hour and 1-day granularity</li> <li>• Exportable CSV information for post processing</li> <li>• Northbound SNMP v2 and v3 interface</li> </ul>

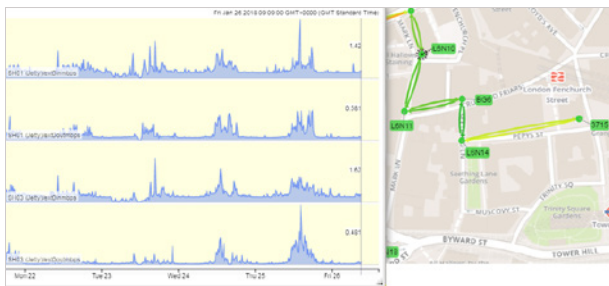
## Fault Management

Historical Alarms can be seen for, one day, one hour or 5 minutes. Alarm details are displayed in the bottom left-hand corner of the screen. The user can also query each Metnet node and link to see the alarm status and more detailed fault information.

The Alarms Window displays current network alarms and historic events. Alarms are colour-coded to indicate priority. They each have date and time stamps, together with the corresponding Metnet node ID number and the alarm description. Alarms and events can be filtered based on priority and the Metnet node ID. They can also be exported into a data file for the purposes of analysis and backup.

## Performance Management

Detailed network performance data is provided via Metnet node link statistics over selected periods of time. Link traffic, RF parameters and Metnet node statistics such as traffic, latency and temperature can all be added to interactive graphs to aid troubleshooting. Performance statistics are exportable into a data file for further analysis.



## Configuration Management

Metnet network bandwidth demands can be managed through the Bandwidth Configuration Window. Bandwidth can be assigned on a per-node basis for both peak and mean traffic demands, and in the uplink and downlink directions. Based on Metnet node demands, the system will automatically configure the network topology and resources to best meet requirements.

## Network Planning

The EMS includes an integrated planning tool that allows operators to model a Metnet multipoint access and backhaul network, to determine the optimal location and configuration of units to meet capacity requirements.

The planning tool uses street data to estimate LOS and calculates theoretical link budgets based on the locations of Metnet nodes. The same self-organizing network algorithms are used to model the optimal network topology, based on capacity requirements and locations of Metnet nodes. Operators can plan extensions to the existing network to understand the effect of adding new sites and ensure capacity requirements can be met.

## Network Upgrade

The EMS can be used to remotely upgrade and manage software releases throughout the Metnet network. New software releases can be scheduled and will automatically be installed with minimal operator input.

### Platform Specifications

<b>Trial Server (20 Nodes)</b>	<ul style="list-style-type: none"> <li>• Chassis: Mini ITX chassis</li> <li>• Processor: Intel i5 processor</li> <li>• Memory: 8GB</li> <li>• Storage: 120GB</li> </ul>
<b>Rack Server (1000 Nodes)</b>	<ul style="list-style-type: none"> <li>• Chassis: 1U Server</li> <li>• Processor: Intel Xeon processor (based on)</li> <li>• Memory: 32GB</li> <li>• Storage: 2x 2TB HDD + 2x 240GB SSD</li> </ul>
<b>Virtual Server (1000 Nodes)</b>	<ul style="list-style-type: none"> <li>• Processor: 4 cores around 3 GHz</li> <li>• Memory: 32GB</li> <li>• Storage: 1TB</li> <li>• EMS to Node Network connectivity: at least 12 Mbps</li> </ul>
<b>Server Operating System</b>	<ul style="list-style-type: none"> <li>• Debian 7 (Wheezy) 64-bit, Debian 9 supported from release 17.0</li> <li>• CentOS 6 64-bit</li> <li>• RedHat 6 64-bit</li> </ul>
<b>Client</b>	<ul style="list-style-type: none"> <li>• Standard Web Browser</li> <li>• Recommended - Chromium/Google Chrome™ and Firefox browsers</li> </ul>

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