

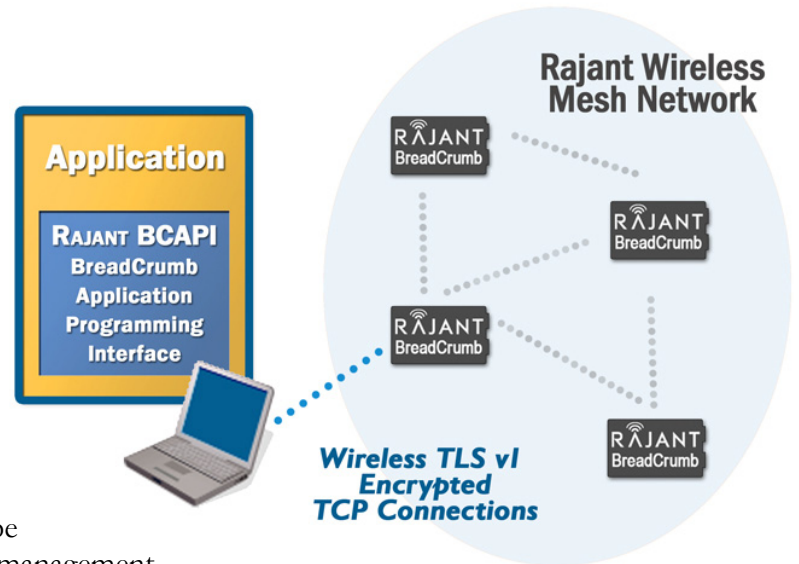
# BCAPI

## Rajant BreadCrumb® Application Programming Interface

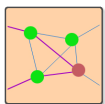
### Rajant BCPAPI

BCAPI is a low-level Application Programming Interface (API) for managing the configuration and reading the state of any Rajant BreadCrumb device running firmware version 10.0 or higher. Rajant BreadCrumb devices are portable wireless systems that utilize a meshing protocol called InstaMesh® for fixed and mobile applications in military, mining and first responder scenarios, among others.

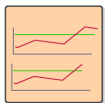
BCAPI communication takes place over a TLSv1-encrypted TCP connection to a BreadCrumb. Through this API, customized management and monitoring applications can be developed. In addition, BreadCrumb network management and monitoring capabilities can be added to existing applications.



Some typical examples of BCPAPI applications are:



**Graphical Display Applications**—Show network topology, connections, maps, and parameters such as channel, signal strength, connection state, security parameters, etc... BC|Commander® itself was developed using BCPAPI.



**Configuration and Alarm Applications**—Set BreadCrumb configuration and create alarms or other functionality based on configurable thresholds for many network and BreadCrumb parameters.



**Data Management Applications**—3rd party applications can be created using BCPAPI to log, sort, forward or store network and BreadCrumb parameters.



BreadCrumb LX

### Requirements

The following are required to use BCPAPI:

- A Java Runtime Environment, version 5.0 or higher (6.0 recommended)
- The BCPAPI .jar file(s), in your application's CLASSPATH
- A multicast DNS client (optional, for discovery of BreadCrumbs)

### Sample Application

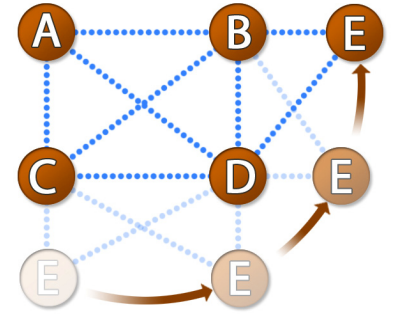
As a tutorial, Java source code for a sample application called 'BCCommandLine' is provided with BCPAPI. This application allows for configuration of a single BreadCrumb at a time via the command line interface.

Rajant BCAPI

**InstaMesh®**

InstaMesh is the advanced networking protocol developed by Rajant Corp. It allows for continuous and instantaneous routing of wireless and wired connections. It enables complete network mobility, robust fault tolerance, high throughput and low latency, with zero maintenance and administration. Rajant's BreadCrumb products combine InstaMesh with support for standards in wireless access, security, network monitoring, quality of service and much more.

In this diagram, the Rajant mesh network adapts to the changes caused by the movement of Node E. New links are established in real-time keeping the network available, intact and secure. Because Rajant uses primarily Layer-2, and does not use a root node or LAN Controller, mobility and bandwidth are maximized.



BCAPI SUMMARY OF FEATURES

**USER SETTINGS**

view	Access to configuration and state.
admin	Read-only access to security settings, read-only access to state, ability to execute non-crypto related commands and read-write to other settings.
co	Read-write access to all settings, ability to execute all commands and read-only access to state.

**BCAPI COMMAND MESSAGES**

Messages	Network Authentication Key (NAK). Set passwords, keys, and reboot, zeroize device and other security commands.
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**BCAPI GLOBAL HARDWARE STATE**

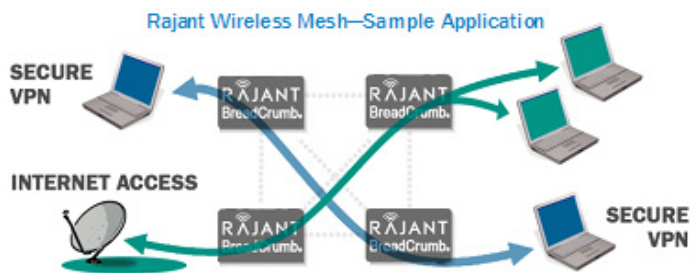
Profile Parameters	Read BreadCrumb model, serial number, model description, hardware revision, hardware configuration parameters, switch parameters, flash memory status, internal battery presence...
Battery Parameters	Battery gas gauge presence indicator, average battery current, charging indicator, temperature, time-until-empty, time-until-full and other battery parameters.
RF Parameters	Radio model, antenna wiring configuration, amplifier configuration, transmit power, country code, fixed channel and other RF settings.

**BCAPI SYSTEM SETTINGS AND STATE**

Firmware	Firmware version, build number, build user, build date/time, hardware platform, system uptime, and more supported features...
Radio	Radio ID, name, operating mode, driver, country code and antenna settings. Radio transmit power, range, beacon time, fragment size, radio RTS/CTS settings, retry count, max mesh peers, channel parameters and others.
Security	MAC address whitelist/blacklist, authentication and encryption algorithms, RADIUS settings...
InstaMesh	Maximum hop count, APT priority, Broadcast Receive Address (BRA) threshold, STP filtering...
VLANs	VLAN assignments by port, VLAN priorities, and more...



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