

AggreGate

The Complete Device Management Solution

Tibbo
TECHNOLOGY

You should read this if...

- You want to **configure, monitor and control** devices over the Internet.
- You are designing and building **intelligent devices**.
- You have an **existing network** of devices you wish to manage better.
- You are locked in by **proprietary systems** for managing your existing devices.

For more information

Go to <http://aggregate.tibbo.com>

Tibbo AggreGate is a multi-industry device management platform that employs modern M2M technologies to control, configure and monitor different electronic devices. It also helps you to aggregate device data into a common database, where you can “slice and dice” it according to your needs, as well as let other enterprise applications transparently access it.

This document explores AggreGate in Q&A form:

- 1 Why was AggreGate created?
- 2 Who are you aiming the system at?
- 3 What can I do with AggreGate?
- 4 What were the key points stressed at design time?
- 5 Why should I invest in your solution?
- 6 What are the key advantages of AggreGate, compared to others on the market?
- 7 Bonus Question: Why did you call it AggreGate?

Remote management is needed.

Serial control evolved into web-browser based control.

Browser-based control is convenient for one device.

Browser-based control is not good for multiple devices.

There are many types of devices that need to be managed remotely. For example, **security, fire alarm, and access control** systems have been offering at least some form of interface for remote configuration, control, and monitoring for the past several decades.

In some of the early systems this was typically achieved using RS232 or RS485 links. Later, with the advent of local area networks and the Internet, these systems gradually started to take advantage of the ubiquitous networking revolution that was (and still is) unfolding around the world. Thus, dedicated RS232 and RS485 links gave way to direct communications over **TCP/IP** networks, while the proliferation of HTTP protocol has led to the emergence of a new form of equipment control using the **Internet browser**.

With direct web-based configuration, the device being configured acts as a small **Web server**. This Web server serves up HTML pages that include dynamic content such as setting values, device status and events, and other useful data. No specialized software has to be installed on the user's PC – the standard browser is used to access the device, and this is the **main advantage** of the browser-based configuration.

Convenient as it may seem, direct device management through a Web browser has **significant limitations**. Configuration of each such device incorporating its own Web server cannot be combined with the configuration of another device, even if both devices are absolutely identical in nature. Working as a Web server, each device sends its own HTML pages, thus requiring the user to open a separate Web browser window for each device being accessed or, alternatively, access each device one-by-one. Certain systems may include hundreds, even thousands of devices and configuring them by accessing HTML pages separately on each device may become **arduous and impractical**.

AggreGate solves this.

AggreGate provides an improved system for **simultaneous configuration**, control, and monitoring of a large number of geographically distributed and disparate devices over the Internet from one or more locations using a **central server** and one or more instances of **client software**.

Reduces costs, eliminates static IPs, works with unstable connections.

AggreGate **reduces the cost** of maintaining a data connection to each device in the system by eliminating the need for real static IP address and firewall reconfiguration for each node. It also solves the problems associated with controlling devices that have **unstable or periodic connection** to the network and the server.

Unique flexible unifying platform for managing multiple devices.

In contrast with prior solutions that either require repetitive individual configuration of each device, or rely on proprietary closed systems designed to support specific devices whose hardware and firmware must match exactly to what the central server software expects, AggreGate offers a **unifying platform** that allows the user to combine devices of different types into a single system without the need for extensive programming or development effort on the server and client software side.

Who are you aiming the system at — Who are your prospective clients?

Umbrella solution cuts time to market for new devices.

We are looking at two distinct types of clients here: The **first client** is a company looking to create an entirely new device, from scratch. At Tibbo, we often encounter firms with a good idea, who are looking for ways to **get to market sooner** and beat the competition. Up until the release of AggreGate, we could help such customers using our advanced modules (such as EM1000) to shorten their hardware development cycle, and they would often take advantage of Tibbo BASIC as well, thus expediting and simplifying their firmware development cycle. Now, we get to offer such a client a **complete ‘umbrella’ solution** – up to, and including, a comprehensive and very powerful networked management system – AggreGate.

Scale effortlessly – think big.

So, in a way, this system lets our customers “**think big**” – they don’t have to worry about how their system will scale.

Manage existing gear, improve efficiency.

The **second type** of customer we’re looking at is enterprises which have already invested in some distributed “smart” equipment, and now have lots of equipment and a plethora of management and asset-tracking systems. AggreGate lets such enterprises consolidate what they have, and use **one simple unified interface** for managing their entire range of devices. Such clients may be interested in the system because it takes what they already have and expands on it – **more bang for the buck** they already spent.

Evaluate and play for free, for as long as you like.

There is, by the way, another “client” we had in mind when developing the system: This is the homebrew-hacker type of guy, the guy who likes to tinker with industrial controllers at home and make interesting things. This is the type of guy we had in mind when we decided to make the system legally free to use to manage a small number of devices. Anybody curious about the system can download it and play with it, and even make something for themselves and just **keep using the system free of charge**.

In a nutshell, AggreGets lets you **monitor, configure** and **manage** your devices, and interconnect them with enterprise systems. Let's break it down a little bit and see some specifics on how it works:

First, AggreGate lets you **discover** and access devices in the network. Once devices are connected, you can directly **manage** them: change device configuration, execute operations provided by the hardware (for example, arm an alarm system or turn on a motor output on a PLC) and monitor events generated by your equipment.

If your devices have unstable network connections, AggreGate handles that gracefully. The system supports **delayed configuration**, which means any changes you make to device configuration are cached and then synched with the device as soon as it comes back online. You also have full access to past events received from the device, and you can view, acknowledge, filter, sort and export them.

AggreGate is a **multi-user** environment, so you can create multiple user accounts and allow every user different levels of access to certain devices or device groups.

Speaking of device groups, one of AggreGate's most powerful features is how it lets you execute **batch operations** on several devices at once. You can group your devices and automatically **replicate configuration** between devices, even when the firmware is different between devices! You can also configure one device as a 'configuration master', and any changes made to that device will propagate to all other devices in its group.

Also, when something important happens with a device, users may be alerted. Alerts can pop up on the operator's screen, but they can also be emailed or sent by SMS.

Important alerts can be configured so that the user must **acknowledge** them by filling in a text field, so you can always tell when a user actually saw the alert and what they had to say about it.

Takes automatic corrective action.

The system can also be programmed to take **automatic corrective** action when an alert is raised. So not only are your users alerted, but effective action is immediately taken to control whatever happened (i.e, devices may be shut down, backup systems brought up, etc). AggreGate also features a periodic **job scheduler** which can be used to automatically execute operations at predefined times.

Data mining with SQL.

As the system sees more use in your enterprise, it will begin amassing large quantities of information about your devices and operations. You can **mine** this valuable information using AggreGate's powerful SQL-based query language and produce informative **reports** analyzing different facets of your operation.

Build your own interfaces.

GUI components are powerful tools to control and streamline system operation. However, trying to do everything with one generic interface can be clunky and uncomfortable. Thus, we've integrated a **GUI Builder** into AggreGate Client. The Builder lets you make your own custom interfaces, just for your users. All modern GUI controls are supported, and you can create a **rich, custom interface** which is just right for your system.

And more...

This is **just a taste** of AggreGate's abilities -- it's not supposed to be a comprehensive list of features, but just to give you a general idea of what the system is capable of.

What were the key points you stressed when designing the system?

Key principles

When we first started thinking up AggreGate and defining the system, several **key principles** solidified as our “guiding yardsticks”. These were things we felt were really necessary to making AggreGate a **unique product**:

Scalable

1) The system had to be scalable. It is -- you can use to manage anything from one device, up to hundreds of thousands. You can even replace the database back-end to make it as **robust as needed**.

Open

2) It had to be open-ended, to fit many different scenarios. The same system had to be useful both for a customer wishing to manage a **vehicle fleet** and one who wishes to manage a **factory floor full of PLCs**.

Reliable

3) It had to be robust and reliable. This goes without saying -- it's a **server-grade, mission-critical** system.

Cross-Platform

4) We wanted it to be cross-platform. Linux is a rising force today, especially in the server market. We didn't want to tie our customers into any specific OS vendor. In fact, they can even **migrate** an AggreGate installation from one operating system to another!

Simple

5) The system had to be as simple as possible without sacrificing functionality. In the alleged words of Albert Einstein, “Everything should be made as simple as possible, but not one bit simpler.” The system is big and robust, but it's **built for ordinary people** to use. We constantly strove to find a middle ground between increased functionality and granularity and user-friendliness.

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Why should I invest in your solution?

Save on management software.

When you buy AggreGate, you don't have to create your own client-server management software, that is very expensive and may take years to develop, test and debug.

Easily integrate your existing software.

Also, you save money on buying other data processing software, such as a reporting engine, an alert system, etc. And your existing custom data processing software (if any) can **easily be integrated** with AggreGate.

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What are the advantages of AggreGate, as compared to other systems?

You can download it.

First of all, AggreGate is the **only system** that can be immediately downloaded and tested. The trial version available for downloading at the Tibbo website is fully functional. This is an **industry-first** – others just talk about their product or show you screenshots. We feel confident enough to let you test-drive the complete system.

Integrated SQL and GUI builder.

Another advantage is that we support many device management operations, including advanced operations such as **data mining** with SQL and **custom interface** (GUI) design from within the software itself – you can build your own management application within AggreGate.

Easily handles unreliable connections.

Also, our system performs very well in environments where devices don't maintain persistent connections with the server. You can still configure them, view their events etc. An **intelligent caching** and synchronization engine makes the whole process smooth and transparent -- the system is built to handle intermittent and unreliable network connections.

Easy to deploy.

It's also very **easy to install** the system, deploy it and connect different devices. Using Tibbo programmable modules and BASIC any customer may connect his own devices to the system, or they could let Tibbo to handle protocol conversion and just "make it work".

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Why did you call it AggreGate?

What's in a name?

The name is a pun (word play). The system does allow you to aggregate your device's data, and it's also a gate through which you may access and operate your devices. The name itself, having two meanings, reflects the system's versatility and varied capabilities.

For more information:
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