



# velocity™

by Atlona

Network Security and Topology

AT-VCC | Atlona Manuals  
AT-VGW | **Control**

## Version Information

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Version	Release Date	Notes
1	Oct 2017	Initial release
2	May 2019	Added system requirements for Velocity Soft Gateways (250, 2500, 5000)

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# Network Security and Topology

## Introduction

Atlona Velocity delivers a highly secure and flexible network topography for small business and large-scale enterprise organizations.

In today's challenging environments of digital networks, security is paramount. Network breaches and attacks are of common occurrence to organizations and are a significant liability to corporate and consumer information. Velocity has been strategically designed to challenge the most sophisticated security attacks. AV control and automation platforms should hold up to the same security standards as any other deployed digital system. It is up to manufacturers of AV technology to adhere and keep up with modern digital security standards.

To deliver on the needs for flexibility, scale, and management, Atlona Velocity implements cutting edge technology and practices. The Velocity platform is built and derived from the Go programming language, React, and MongoDB®. These technologies are backed by both Google™ and Facebook®. Velocity is positioned to be the leader in performance, stability, and flexibility by harnessing these modern technologies. This provides the ability to service clients with a cost-effective and scalable AV control platform.

In the modern age of distributed computing systems, it is not enough to only operate technology on a single hardware appliance. Distributed and scalable systems can now be deployed within virtual machines, Linux® containers, and cloud-based architectures. Velocity can be deployed within any of these architectures. This provides the flexibility for AV integrators and IT organizations to design the best solution to fit the organization's needs.

## System Requirements

The Velocity Soft Control Gateway requires a server running VMWare® ESXi™ installed, a virtual machine provisioned, and the following system requirements:

System Requirements	VSG-250	VSG-2500	VSG-5000
Operating System	VMware - ESXi 6.5.0+	VMware - ESXi 6.5.0+	VMware - ESXi 6.5.0+
RAM	4 GB (recommended)	16 GB (recommended)	32 GB (minimum)
CPU	Intel® Pentium® N4200 Quad-Core Processor	Intel® Xeon® 2.4 GHz Dual-Core Processor	Intel® Xeon® 2.4 GHz Quad-Core Processor
Ethernet	1 GbE	1 GbE	1 GbE
HD Space for Virtual Machine	32 GB	64 GB	100 GB

## Security

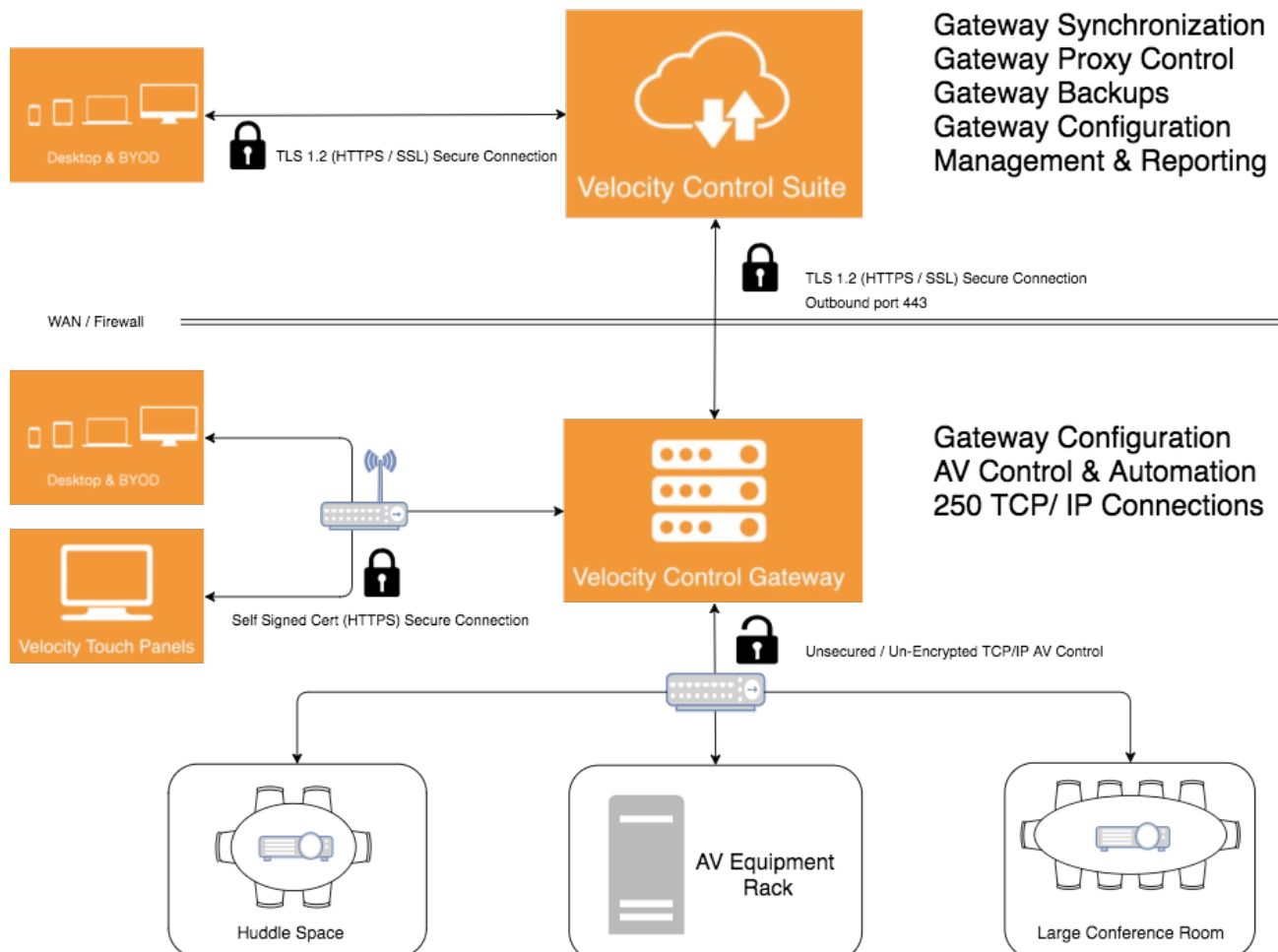
Atlona Velocity deploys the latest standards in network security strategies and protocols to protect and prevent network breaches into Velocity and third-party integrations. Velocity deploys the following security standards:

- TLS 1.2, ECDHE\_RSA with P-256, AES\_128\_GCM, HTTPS security.
- Slow hashed passwords.
- Two-factor authentication.
- Private LAN self-signed certificates.
- Cross-site request forgery prevention.
- Cross-site scripting prevention.
- No backdoor access.
- Limited TCP/IP port exposure.
- Secure Linux operating system.
- Role-based features.

## Velocity Gateway Appliance

The AT-VGW-250 control gateway can support a maximum of 250 TCP/IP connections to AV equipment. With a general assumption that most corporate spaces would comprise of 10 or less controlled AV appliances, a single AT-VGW-250 can support approximately 25 rooms or more. *Figure 1* depicts a general flow diagram and shows how to control and configure a single gateway appliance from a cloud or LAN environment.

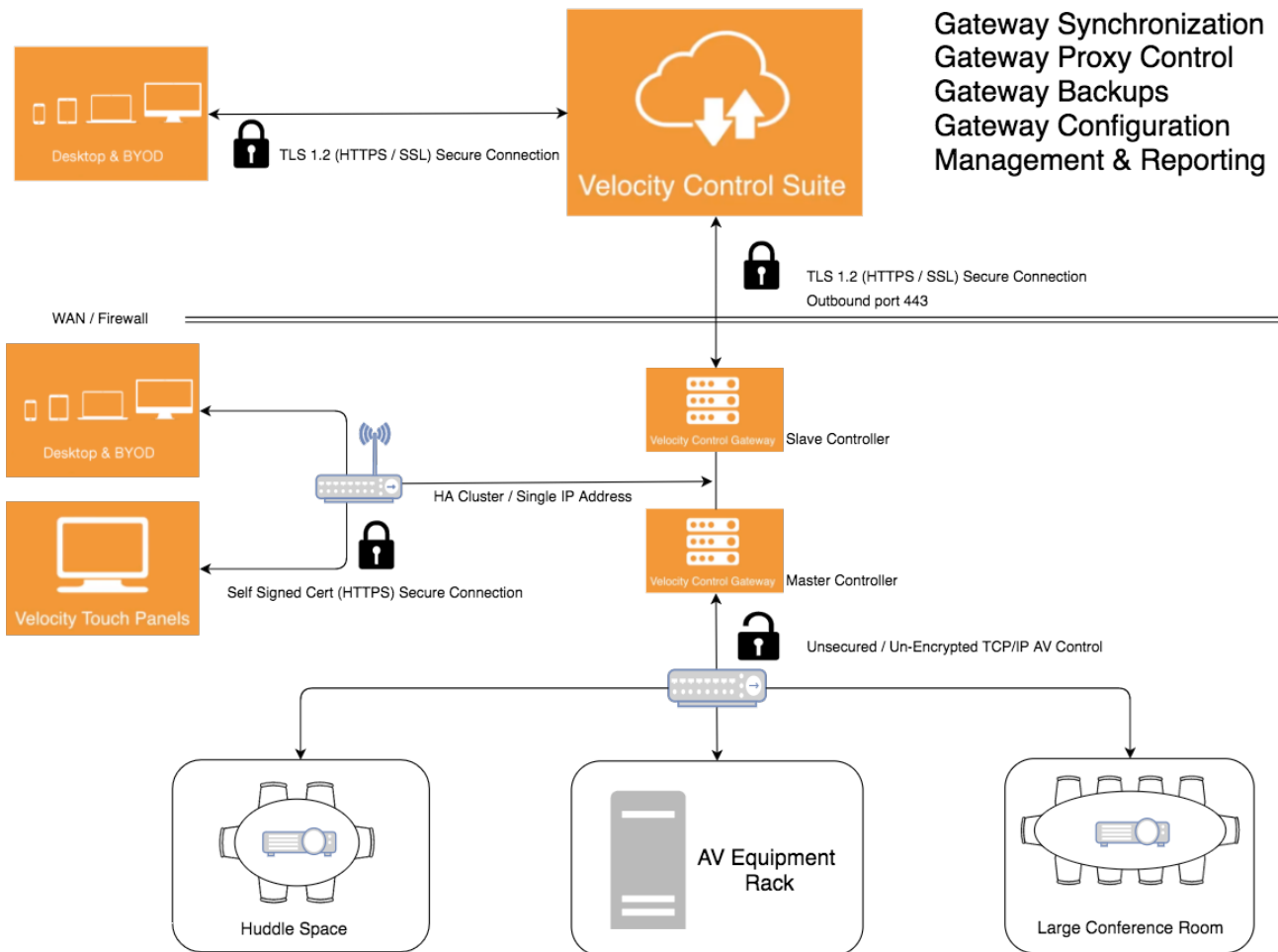
Figure 1



## Velocity Gateway Appliance Redundancy

For organizations who require High Availability (HA) service for AV technology solutions, the AT-VGW-250 can be configured in a master/slave control setup. This requires a two-appliance approach. Due to the nature of some AV appliances only allowing a single TCP/IP connection, a master controller is dedicated to all AV connections. In the event the master is not available, the slave will engage all required connections and take over control requests. The slave now becomes the master controller. In a configuration where there are more than two gateways operating, some gateways become Control Managers that manage a partial set of the system's TCP/IP connections.

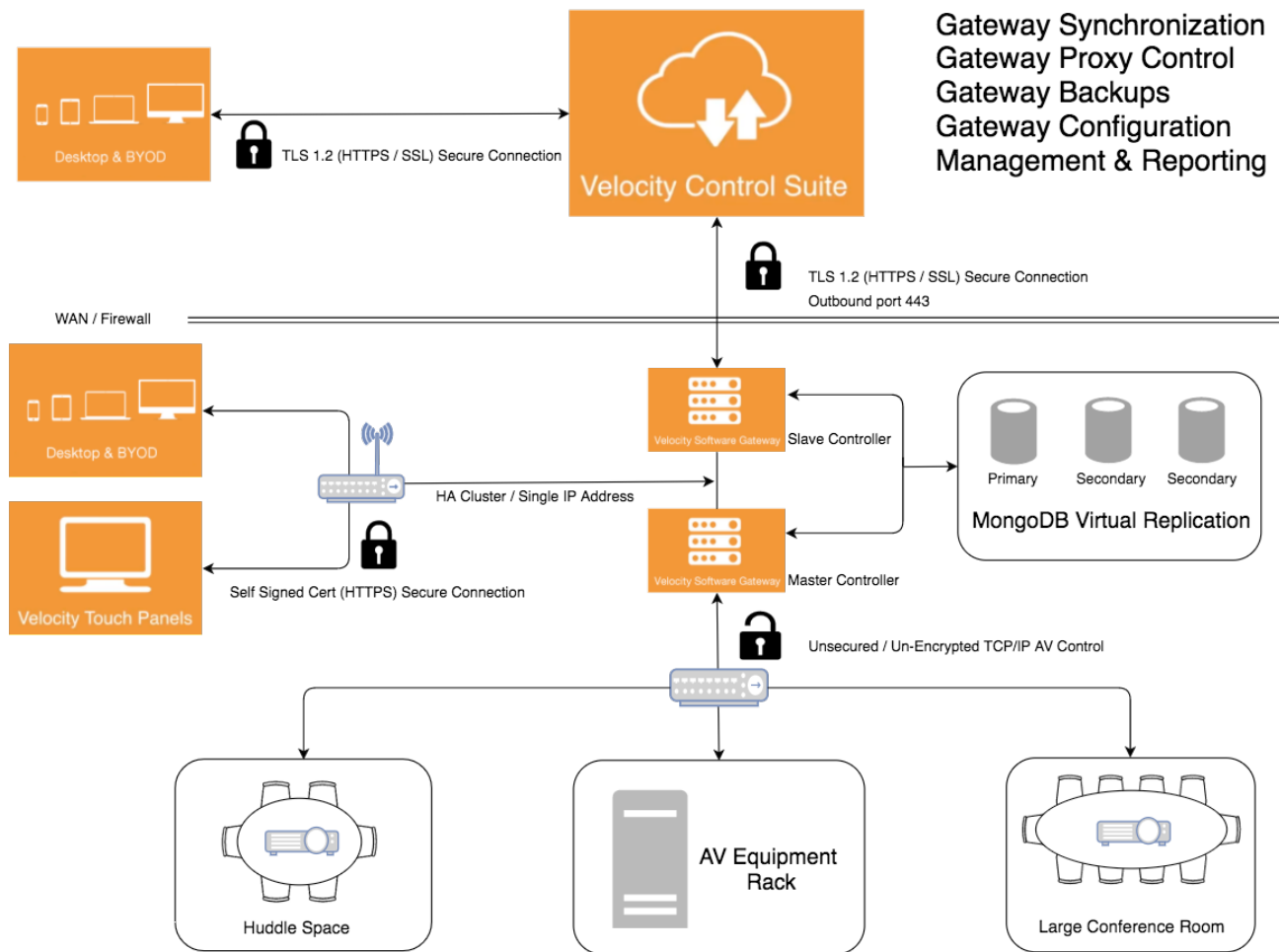
Figure 2



## Velocity Virtual Software Gateway

Operating Velocity in a virtual environment(s) can provide much flexibility and scale to both small and large corporate organizations. The AT-VSG can be licensed for 2500 or 5000 IP connections per virtual instance or group cluster. The Velocity Virtual Software Gateway (VSG) can also be a single self-contained virtual machine or a fully distributed High Availability (HA) server cluster paired with multiple database-replicated virtual machines. *Figure 3* depicts a more complex setup for Velocity configured in an HA / database replication environment.

Figure 3



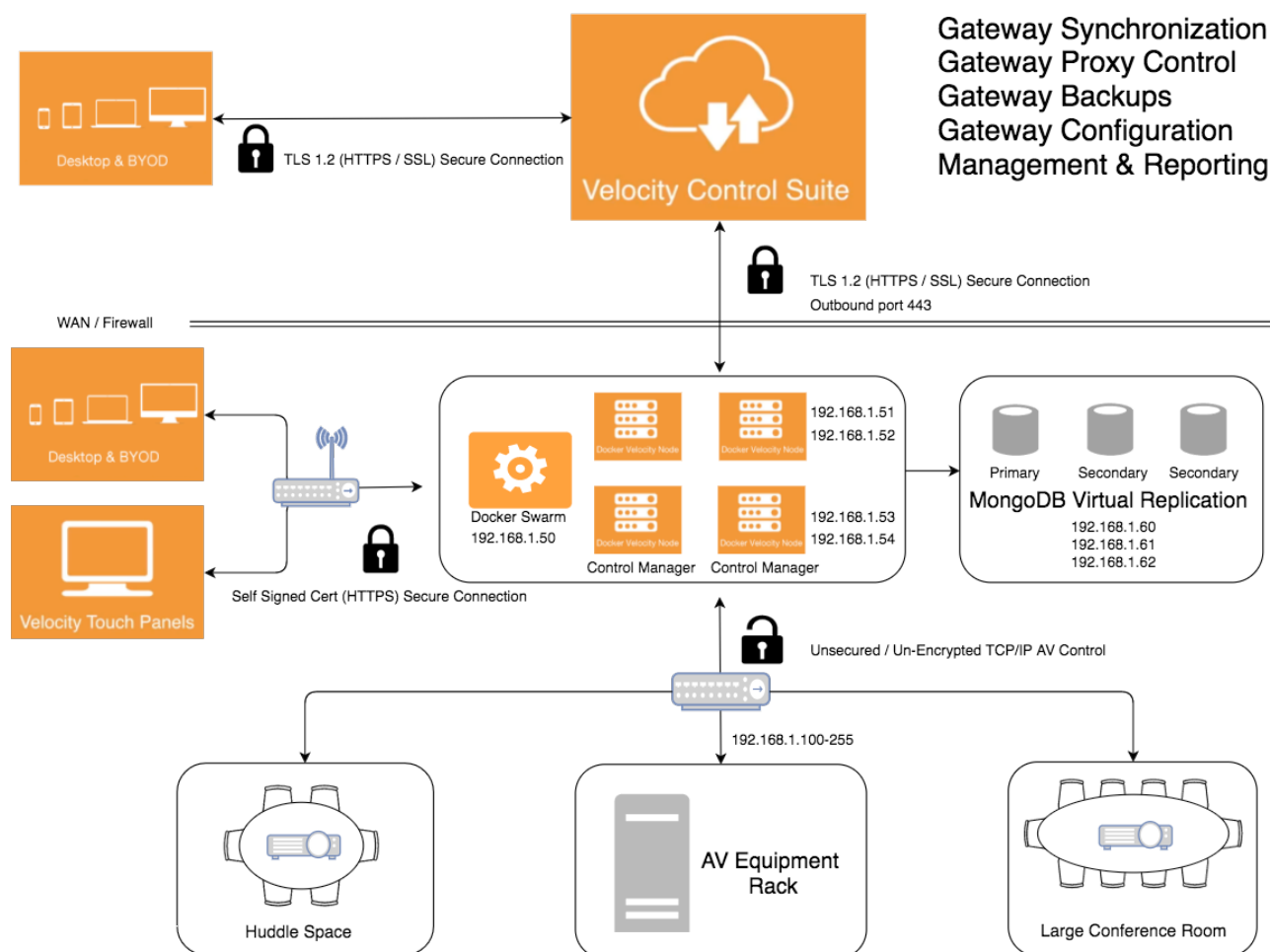
## Velocity Virtual Software Gateway Linux Containers

In the event an organization prefers to operate using Linux containers, Velocity can be executed within a container. Velocity operates within Linux containers via the use of Docker. Docker is an open source Linux container engine that executes software from within the container and, in addition, can manage and orchestrate Docker containers using Docker Swarm. For more information about Docker, visit <https://www.docker.com/what-docker>. To manage a Docker cluster, please visit <https://docs.docker.com/engine/swarm/swarm-tutorial>.

Docker can be installed and operated within all three major operating systems for macOS® Yosemite 10.10.3 or above, Microsoft® Windows® 10 Pro or Enterprise 64-bit or Windows Server® 2016, nearly all major Linux editions, and nearly all major cloud providers. Velocity is dependent on MongoDB database for storage of configuration, runtime information, and reporting data. Today, Docker is not the recommended choice for running enterprise class database systems. It is still highly recommended to run your MongoDB replicas within a virtual machine stack or on bare metal machines.

Velocity can be configured with as many Docker nodes as desired for best performance and management. When multiple nodes are spawned, Velocity will configure specific nodes as Control Managers. These managers will be the central point of TCP/IP connections with AV equipment. This is done to meet the challenge of single socket connection appliances. *Figure 4* shows a hypothetical Docker configuration.

Figure 4





### Velocity Control Suite Private

The Velocity Control Suite hosted on the cloud at <https://velocity.atlona.com> is a shared hosted service. Velocity Control Suite can also be hosted as a dedicated private service, either on an internal LAN or hosted via a cloud provider. More information on licensing and hosting options coming soon.

### Network Traffic I/O

Typical network traffic for the Velocity platform requires a 10/100 Mbps network switch. The platform is designed around push notifications to keep overall network traffic to a minimum. Usages with specific AV equipment may vary depending on API design and implementation of control for specific third-party equipment.

Browser traffic is also kept to a minimum by design of Single Page Application (SPA), browser caching, and HTTP 2.0 technology. Navigation from page to page by users is done by partial data requests rather than a full-page HTTP request. Full-page requests are only performed once on initial load to minimize traffic. Velocity supports browser caching to minimize HTTP file requests. Velocity also supports HTTP 2.0 which deploys new request compression technology to reduce traffic payload.

Below are average traffic requests for browser access.

Request page	Request type	Cached	Payload (kb)
Home	Full page	No	1500
Home	Partial page	No	173
Home	Full page	Yes	241
Home	Partial page	Yes	2.2
Room Modify Devices	Full page	No	1600
Room Modify Devices	Partial page	No	301
Room Modify Devices	Full page	Yes	588
Room Modify Devices	Partial page	Yes	301
Room Control	Full page	No	1500
Room Control	Partial page	No	170
Room Control	Full page	Yes	415
Room Control	Partial page	Yes	170
N/A	HTTP POSTS	N/A	< 200
N/A	AV equipment API calls	N/A	< 1

### Network Ports

The following default ports are required to be open on your router to communicate to and from Velocity for both LAN and WAN networks.

Port number	I/O type	LAN required	Cloud required
80	HTTP requests	Yes	No
443	HTTPS requests	Yes	Yes
23	Atlona API Telnet	Yes	No
52315	Velocity MQ Pub / Sub	Yes	No

### Cloud Connectivity

In order for Velocity Gateway appliances to be connected to the cloud, two-way traffic must be allowed to and from <https://velocity.atlona.com>.

