



Technology Specifications



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1. OVERVIEW

Rethink is an online solution for special educators to promote inclusion and address behavior. Our platform supports curriculum planning, professional development, and tracking of student progress through digital and online tools. The below is a resource providing technical overviews and specifications for the Rethink platform. Specifications are grouped by Technology and Infrastructure, Hardware and Operating System Recommendations, Web Browsers, Connectivity, Network Configurations and Security.

2. TECHNOLOGY AND INFRASTRUCTURE

2.1 Technologies

The Rethink solution is delivered over the Internet using virtual machines (VMs) for web and database servers, Azure web apps to host web applications, and Azure blob storage for content storage. Our applications combine both dynamically generated application features and statically published educational content. Rethink web applications are developed using the latest development practices and technologies. Customer-facing solutions are developed in .NET Core, MVC Framework, C#, Angular, and SQL technologies using sophisticated design principles and some of the best Web 2.0 functionality available.

2.2 Facility

The Rethink solution is hosted in the cloud, using a Microsoft-managed datacenter in East US 2 region, state of Virginia. Secondary data center in the West coast has been implemented to host Rethink solution in case of a disaster.

2.3 Server Technology

Rethink hosts its applications and services on Intel cloud-hosted server hardware on Windows Server 2018 machines. .NET Core applications are hosted on Azure Web Service. Rethink videos are hosted by Azure Media Services and BrightCove.

2.4 High Availability

All servers are set up in a high-availability fashion to ensure ultimate up-time for our customers. An active server takes in all the traffic and a warm backup server is on stand-by with continuous synchronization. Should one server go down at any one point in time, the second server automatically kicks in without any manual intervention. Disaster recovery is also in place to ensure automatic failover in case of a data center outage.

2.5 Load Balancing

Hardware-based load balancing distributes end-user connections across a “farm” of servers. This enables balanced load, fault tolerance and redundancy of the applications. The Rethink load balancing solution is provided by Microsoft Azure.

2.6 Content Delivery Network

Rethink hosts our educational content in Azure blob storage. Azure storage automatically replicates data to help guard against unexpected hardware failures and make sure it's available when you need it. Content is triple-redundant with an option of geo-redundant storage across hundreds of countries.

2.7 Data Back-up

Rethink employs multiple levels of backups to ensure your data is safe. Azure SQL provides automatic continuous backups for all databases. Backups are available multi-region as an offsite contingency. Weekly backups are kept for a duration of 6 months and monthly backups for a duration of 5 years. Weekly backups are also created for any development purposes.



2.8 Monitoring

Rethink hardware and software is continuously monitored on a number of levels. Microsoft facility is designed to run 24x7x365 and employs various measures to help protect operations from power failure, physical intrusion, and network outages. These datacenters comply with industry standards (such as ISO 27001) for physical security and availability. Automatic web-tests are employed running every 30 seconds, to check on site availability and the user load- and application-response times. Our monitoring systems are connected to an automated alerting system, which notifies Rethink operations staff of any noted issues. Softchoice provides another layer of 24/7 monitoring for all production services to alert of critical failures.

3. HARDWARE AND OPERATING SYSTEM RECOMMENDATIONS

The Rethink solution functions on a wide variety of computer platforms, including dedicated desktop or laptop computers, thin client installations and mobile devices. This section describes the basic hardware and operating system recommendations for customers accessing the Rethink platform.

3.1 Mac OS X

OS Version	10.5 or greater
Memory	256 MB or greater

3.2 Windows 8, 10

OS Version	Windows 8 or greater
Processor Speed	500 MHz or greater
Memory	256 MB or greater

3.2.1 Use of Older System Configurations and Software

The system recommendations listed in this document reflect the software and computer system configurations that Rethink actively supports. Please be aware that older browsers with older operating systems do not recognize the security certificate installed. As such, for any schools still using Windows 7 or below, Internet Explorer is not an option, and may require a modern browser like Chrome or Firefox.

3.4 Chrome

OS Version	Chrome OS
Processor Speed	1 GHz or greater
Memory	1GB or greater

3.5 Mobile

iPhone	iPhone X, iPhone 8+, iPhone 8, iPhone 7+, iPhone 7, iPhone 6+, iPhone 6, iPhone 5s
iPad	iPad Pro, iPad Mini 4, iPad Air 2, iPad Mini 3, iPad Mini 2, iPad 4, iPad 3, iPad 2
Windows phone	Nokia Lumia
Android phone	Samsung Galaxy (all phones): Galaxy S9, Galaxy S8, Galaxy Note 8, OnePlus 6, Google Pixel 2, Sony Xperia, Moto G5/6, Galaxy s7, Galaxy s6, Galaxy s5, Google Nexus (all)
Android tablets	Samsung Galaxy Tab S2/S3, Lenovo Tab 4, Google Nexus, Samsung Galaxy tab, Samsung Galaxy Note, Kindle Fire (supported for app ONLY)

3.4.1 Use of Kindle Fire



Kindles are not capable of supporting HTML5 or any of the latest technologies. Seeing that the Rethink websites utilize the latest technologies (AngularJS), it unfortunately will not work with the device. Kindle tablets can, however, be utilized, for the data collection app.

3.6 Display

Rethink solution supports various resolutions and many screen sizes.

3.7 Sound

Sound is an important part of the Rethink solution to be able to view our videos. Hardware support for sound playback is required for lesson videos. We recommend the availability of headphones for use in public computing scenarios.

4. WEB BROWSERS

Rethink fully support a wide variety of properly configured modern browsers. Older generation browsers will also very likely function properly with our service if the browser supports CSS, JavaScript, Java and the Flash plug-in. This section lists the supported and recommended browser for users of the Rethink platform.

4.1 Recommended Browsers

The latest version of web browser software includes the most comprehensive security, usability and web site rendering functionality. Rethink routinely tests the latest release of the major browsers offered for the Windows and Mac OS X operating systems. Consequently, we recommend these browsers as the best option for customers looking for a secure, successful experience with the Internet generally and the Rethink solution in particular. As of the release of this document, these are the recommended browsers for use of the Rethink solution.

For customers using the Microsoft Windows operating system:

- Firefox 91 and subsequent versions
- Chrome 92 and subsequent versions
- Internet Explorer 11 and subsequent versions
- Microsoft Edge 92

For customers using the Mac OS X operating system:

- Safari 11
- Chrome 92 and subsequent versions
- Firefox 91 and subsequent versions

4.2 Supported Browsers

Most browser software released in the last 3-4 years is fully supported by the Rethink platform. Supported browsers represent software known to function properly with the Rethink solution. We strongly recommend that customers deploy more recent versions of these browsers as subsequent releases typically contain security fixes that preclude potential compromise of computing systems.

For customers using the Microsoft Windows operating system:

- Firefox 83 and subsequent versions
- Chrome 85 and subsequent versions
- Internet Explorer 10
- Opera 70 and subsequent versions

For customers using the Mac OS X operating system:

- Safari 10.1
- Chrome 85 and subsequent versions



- Firefox 83 and subsequent versions
- Opera 70 and subsequent versions

Notes on supported browsers:

Please be aware that older browsers with older operating systems may not recognize the security certificate installed. As such, for any clients using Windows 8 below, Internet Explorer may be not an option. As an alternative, clients with Windows 8 can use other browsers like Chrome or Firefox. This is only a problem with very old operating systems and Internet Explorer as a browser.

4.3 Browser Configuration

All web browsers must have the following functionality enabled to properly access the Rethink platform.

- JavaScript enabled
- Cookies enabled
- Pop-up blockers turned off for Rethink domains

5. DATA COLLECTION APP

Rethink offers a data collection app for customers looking for flexibility and use-of-ease. The mobile app allows access to data collection piece of Rethink only, offering both online and offline access. This section describes the basic hardware and operating system recommendations for customers using Rethink data collection app

iPhone	iPhone 11, iPhone X, iPhone 8+, iPhone 8, iPhone 7+, iPhone 7, iPhone 6+, iPhone 6	iOS version 12.0 and up
iPad	iPad Pro, iPad Mini 4, iPad Air 2, iPad Mini 3, iPad Mini 2, iPad 4, iPad 2, iPad 3, iPad 4, iPad 5, iPad 6, iPad 7	iOS 12.0 and up
Android phone	Samsung Galaxy: Galaxy S9, Galaxy S8, Galaxy Note 8, OnePlus 6, Google Pixel 2, Sony Xperia, Moto G5/6, Galaxy s7, LG, HTC, etc.	Android version 5.0.2 and up
Android tablets	Samsung Galaxy Tab S2/S3, Lenovo Tab 4, Google Nexus, Samsung Galaxy tab, Samsung Galaxy Note, Kindle Fire (supported for app ONLY), Acer, Asus, etc.	Android version 5.0.2 and up, Fire OS (for Kindles)

6. CONNECTIVITY

A high-speed connection to the Internet is recommended for better the user experience. However, Rethink platform can still be used via a dial-up connection. We engineer our systems to minimize the required bandwidth for client users making extensive use of caching, compression and HTTP protocol technologies. Whether dedicated or shared, the connection must be stable with minimal packet loss and latency, and no route flapping.

7. NETWORK CONFIGURATIONS

7.1 Rethink Domains

Access to the following domains and network address blocks should be unrestricted for your user population.

- Rethinkfirst.com
- Rethinked.com
- Rethinkautism.com



- Rethinkbenefits.com
- Rethinkbehavioralhealth.com
- Rethinkbh.com
- CareManagement.Rethinkbh.com
- TheraWe.co
- Whil.com
- GoVizzle.com

7.2 Third-party Domains

Rethink lesson videos are currently hosted by iMediaSee. Training videos are hosted on BrightCove servers. Accordingly, the following domains will need to be whitelisted:

- *.brightcove.com
- fstream.imedisee.com

7.3 Network Ports

Allow content from our servers to arrive on your client computers through your router, firewall, and/or proxy server over the following ports:

- 80 (for HTTP traffic from our Web servers)
- 443 (optional - for SSL traffic from our secure Web servers)
- 1935 (for iMediaSee video stream)

8. SECURITY

All Rethink domains are protected by SNI SSL certificate to ensure encryption for data in motion. Database level encryption using Symmetric Key AES 256 algorithm encryption is in place as well for securing data at rest. SNI certificates are updated regularly for all Rethink domains as well as for API. Multiple security steps have been taken to ensure a secure service to our clients.

8.1 Remote Access

Securing access to Rethink Virtual Machines are maintained on multiple levels. Remote connection to Rethink servers is tightly secured by using tunneling and encryption protocols. In addition, the following best practices are followed to reduce exposure to attacks.

8.1.1 Username / Password

Complex usernames and passwords are set up for all servers, with a requirement of a minimum 8 character long with 3 of the following: a lowercase character, an uppercase character, a number, a special character. New accounts will be required to provide passwords at least 12 characters long.

8.1.2 Endpoints

Endpoints are only added on a need basis and eliminated when no longer in use. For Remote Desktop, the default port of 3389 is not used, but rather changed to help reduce exposure.

8.2 Internal Load Balancing

Internal load balancing (ILB) enables Rethink to run highly available services behind a private IP address which is accessible only within a cloud service or Virtual Network (VNet), giving additional security on that endpoint. As a security enhancement, Rethink application tier and backend databases are run behind an ILB so that they are not exposed to public Internet, but still offer high availability through load balancing.



8.3. Separate development / testing / production environment

Development and testing of web applications is done on servers isolated from the internet, and do not use or connect to real life data and databases. This stands true for both server/applications and any data sources used.

8.4 Web Application Content

Publicly available content is stored in blob storage. Writing to blob storage, however, is restricted to the Rethink IT team only.

8.5 Permissions, Privileges and Network Controls

File and network service permissions are limited to authorized Rethink IT staff only and controlled via Windows Azure Subscriptions. The following network vulnerabilities and controls are in place:

8.5.1. Interception Controls

- Physical access controls at data centers is limited to Microsoft personnel only
- Central office machines of IT staff are password-protected
- Upon termination of employees, all passwords are updated

8.5.2 Availability Controls

Redundant paths are currently set up for every resource as well as an access point and automatic routing to switch traffic to the available path without loss of data or time. This ensure optimal up-time to Rethink clients. This includes:

- Fault-tolerant production environment with multiple servers set for the application tier (currently served by a farm of 10 web servers) and backend databases (served by 2 Always-On servers)
- Automatic routing to switch the traffic upon failure of any web or database server.

8.5.3 Access / Entry Point Controls

See Section 7.1.2 – Endpoints. Additional security measures include:

- Firewall
- Physical separation of back-end servers from public-facing interfaces
- Antivirus software installed on all servers and workstations
- Electronic sessions are terminated after 50 minutes of inactivity

8.6 Monitoring/Logging

All Rethink applications and virtual machines are deployed in Azure, and are enabled with a set of operating system security events. Azure logs administrative operations, including system access, to create an audit trail in case unauthorized or accidental changes are made. Audit logs can be retrieved for view access and usage reports. Automatic email alerts are set up for head IT staff based on predetermined rules.

8.7 Data Encryption

8.7.1 Data-At-Rest

- Database level encryption using Symmetric Key AES 256 algorithm encryption, encrypting all PHI data and prevents database level attacks
- Protection of sensitive data in backup media and when interacting with raw database tables/objects

8.7.2 Data-In-Motion

- TLS 1.2 certificate with SHA-256 (SHA-2) hash algorithm that provides encryption for data in motion and includes built-in controls to prevent tampering with any portion of the encrypted data



- Protection of web application data from unauthorized use and modification utilizing secure channels during transmission of data between client and server
- Sensitive data is never transmitted via URL arguments. It is stored in a server-side repository or within a user's session
- All requests to the domain are sent over HTTPS using IIS redirects
- Sensitive data is never cached or persisted, preventing potential data leakage issues at the client or intermediary proxies

9. VIRTUAL SUPPORT

9.1 Conferencing Technology

Rethink provides virtual support to customers through the use of an online meeting software called **GoToMeeting**. Customers must have access to the GoToMeeting software in order to access support and web-based platform training. Check below for a list of the GoToMeeting system requirements or [run your system's compatibility automatically](#).

Operating System	Windows 7 - Windows 10 Mac OS X 10.9 (Mavericks) - macOS Mojave (10.14) Linux/Ubuntu (Web App only) Google Chrome OS (Web App only) iOS 12 Android OS 4.4 (Kit Kat) - Android 9 (Pie) Windows Phone 8, Windows 8RT or later
Web Browser	Google Chrome v85 or later Mozilla Firefox v83 or later
Internet Connection	Computer: 1 Mbps or better (broadband recommended) Mobile device & Chromebook: 3G or better (WiFi recommended for VoIP audio)
Software	Zoom desktop app
Hardware	4GB or more of RAM (recommended) Webcam for HD Faces (not required) Microphone and speakers (USB headset recommended)**
Mobile Device	iPhone 4S or later iPad 2 or later