Crestron Fusion®

11.2.0014.0028

Product or Content Description

Notes and Recommendations

The Crestron Fusion® enterprise management platform enables organizations to monitor and manage AV equipment, BMS, room scheduling, lighting, shades, climate, and energy consumption from a single platform. You can deploy Crestron Fusion® as a service hosted and operated by Crestron, on your own on-premises equipment/Virtual machines, or on a CEN-FUSION-SERVER-R330 rackmount server, based on organizational needs.

The monitoring functions of Crestron Fusion® enables facility and IT managers to monitor, manage, and schedule AV presentation, video conferencing and capture resources from one central location. It can track device and room usage to schedule routine maintenance, provide real-time remote technical support, and receive instant alert notifications. Robust reporting features provide data to make more effective purchasing and scheduling decisions.

The smart building integration features of Crestron Fusion® manages and monitors renewable and sustainable energy sources in real-time and displays historical usage data for day, week, month or year. It also provides environmental control, including lighting, shades and climate to intelligently integrate with room scheduling and occupancy levels for greater energy savings. Crestron Fusion® is able to track the building's carbon footprint while enabling facility managers to easily analyze energy consumption.

For assistance with Fusion, please contact Crestron's True Blue Technical Support team by calling 1-888-CRESTRON or by sending an email to the dedicated Crestron Fusion® Support Group (FSG) at fsg@crestron.com .

Software Upgrades

Crestron Fusion® in-place upgrades of the software and database is supported from versions 9.2, 9.3 or 10.x. Upgrading from version 8.5 or earlier will not work. The installer will remove the previous version while upgrading your existing database. All of your existing data will be maintained, except for historical meeting information which will have to be back-filled by a separate process (see below). If your current Crestron Fusion installation precedes version 9.2, an upgrade to 9.3 is required as an intermediate step before upgrading. In addition, if your previous version comprised of three databases (main, log, and report databases), those three databases must be merged into one database. Contact the Fusion Support Group for assistance.

If you are migrating an on-premises installation to a Crestron hosted installation, Contact the Fusion Support Group for assistance.

Directory Structure:

All files that comprise Crestron Fusion® are consolidated into one folder:
C:\Program Files\Crestron\Fusion

Fusion Services Manager and Configuration Manager logs are stored in:

C:\Program Files\Crestron\Fusion\Logs

The Crestron Fusion® Services Manager will create all Crestron Fusion® instances in:
C:\Program Files\Crestron\Fusion\FSM\Instances

Logs for each of the Crestron Fusion® services are stored in:
C:\Program Files\Crestron\Fusion\FSM\Instances\Fusion\Logs

System Requirements and Dependencies

Database Access and Credentials:

Certain levels of database access are required depending on the operations being performed in the database. In general, the account accessing the SQL Server database needs DB_OWNER rights for all runtime operations. This includes (but is not limited to) operations performed within the setup interface for creating, editing, deleting, and moving objects such as nodes, rooms, and assets. Modifying the database schema itself, or changing the authentication model of the application, requires the account accessing the database to be elevated to SYSADMIN rights. The conditions under which SYSADMIN rights are needed are as follows:

- Creating a new database
- Upgrading an existing database
- Changing client authentication between forms and Windows
- Performing a “Force DB Update” operation

Once any of these operations are complete, the account accessing the database can be reverted to DB_OWNER rights only. It is important to note that Fusion requires “DB_OWNER” rights of the Fusion database, but simple operations that do not affect the database structure such as changing the authentication type or licensing requires that the SQL account running fusion, also have read access to the Master, model, and MSDB databases. This is because Fusion uses SMO, SQL Management Objects and cannot access any database without first reading the system databases.

V. Hardware & Software Requirements

Component	Minimum	Recommended
Operating System	Windows Server 2012 R2	Windows Server 2016, or later
Processor	Dual Core Intel Xeon 2.8 GHz	Two Dual Core Intel Xeon 2.8 GHz
Memory	8 GB	16 GB
Hard Drive	250 GB Primary Drive	500 GB Primary Drive, RAID 160 GB OS Drive, SSD
Display Resolution	1024 x 768	1280 x 1024 or higher
Database Server	SQL Server 2008 R2	SQL Server 2017, or later
Browser	Firefox, Safari, Chrome	Chrome

Additional Software Requirements

Fusion requires the following additional components; please see the full list of required Windows roles and features in the installation guide.

- Servers connecting to Crestron PinPoint will require HTTPS and a secure certificate. Pinpoint is no longer supported.
- SMTP Mail Server access for sending email notifications
- Crestron Toolbox is required to support outbound symbol auto-discovery; you can download the latest version from the Crestron website: http://www.crestron.com/resources/product_and_programming_resources/catalogs_and_brochures/online_catalog/default.asp?jump=1&model=SW-TB

Operational Installation/Upgrade Instructions

Getting Started

Crestron Fusion requires user authentication before launching the application. A login dialog is presented to the user when the client starts (if using forms authentication). For a new installation, the default username is "admin". The default password is “admin” and may be a different password if provisioned by Crestron or a dealer.

NOTE TO ADMINISTRATORS: Change the default admin password immediately to prevent unauthorized access to the software.

Licensing

An unlicensed version of Crestron Fusion® traditionally allowed five symbol connections and 5 Crestron PinPoint users. This has changed in 11.1.5000.

A new install of Crestron Fusion no longer supports any connection without a license. The software requires a license to make any room connection.

When contacting Crestron for a license be sure to send the key code for the client application you wish to install. Call 1 888 CRESTRON to obtain a license.

Version History

Version	Date
Release 1: Version 11.1.1000.0037	9/1/2017
Release 2: Version 11.1.2000.0023	11/3/2017
Release 3: Version 11.1.3000.0025	12/18/2017
Release 4: Version 11.1.4000.0028	2/6/2018
Release 5: Version 11.1.5000.0022	3/30/2018
Release 6: Version 11.1.6000.0092	7/30/2018
Release 7: Version 11.1.7000.0055	12/31/2018
Release 8: Version 11.1.8000.0048	5/20/2019
Release 9: Version 11.1.9000.0066	11/11/2019
Release 10: Version 11.2.0001.0035	1/23/2020
Version 11.2.0002.0130	9/28/2020
Version 11.2.0003.0109	1/25/2021
Version 11.2.0004.0040	6/14/2021
Version 11.2.0005.0074	8/17/2021
Version 11.2.0006.0063	11/17/2021
Version 11.2.0007.0141	5/18/2022
Version 11.2.0008.0049	2/24/2022
Version 11.2.0009.0029	6/19/2022
Version 11.2.0010.0022	8/15/2022
Version 11.2.0011.0029	9/19/2023 INTERNAL
Version 11.2.0012.0067	5/7/2024

- Version 11.2.0013.0026 9/3/2024
- Version 11.2.0014.0028 9/23/2025

Version 11.2.0014.0028

Version 11.2.0014.0028 is a public release.

Changes since Last Version

New Features

- Added new All Config value "SymbolDiscoverTimeoutMiliSeconds". This increases the timeout to Toolbox when discovering devices.
- Added several new tools located in the "C:\Program Files\Crestron\Fusion\FSM\Instances\Fusion\Tools folder "
    - Find Actions Fired
    - Find all D4NS
    - Fusion Micros Tester Async
    - Find all about a MAC
    - Get Troubleshooting Stats
    - Purge Fusion Database
    - Set Timeouts
    - Validate Micros Actions
- Added new feature on Fusion Configuration program to reset the "Admin" password
- Changed the logo for the API
- When Apply is clicked, verbose mode is chosen automatically

Security fixes:

- None

Bug fixes:

- Fixed Tree painting issue if tree JSON > 2GB – if more than 7K rooms
- Fixed upgrade issue. Can upgrade from 10.0.12
- Fixed changing MS Graph Secret does not require reboot anymore
- Fixed proxy ability for MS Graph. Now the Fusion server can be completely isolated from the internet and use the proxy settings to get MS Graph calendars
- Fixed several R25 Issues

Known Issues and Behaviors

- Nothing has changed since 11.2.0012.0067

Version 11.2.0013.0026

Version 11.2.0013.0026 is a public release.

Changes since Last Version

New Features

- Change the room or time of a single instance of a recurring meeting
  - If a single instance of a recurring series needs to be moved to another room, the operation can be performed via outlook or Gmail.
  - Single instances of meetings cannot be modified via the Fusion web client.
- Mass Edit up to 500 rooms at a time:
  - As many as 500 Rooms can be modified at once providing, they are in the same node.
  - This will aid in migrating from Exchange EWS to MS Graph.

Security fixes:

- None

Bug fixes:

- Fixed an issue where external calendars could not be validated
  - External calendars do not need to be real SMTP Addresses.
- Fixed an issue where Fusion could not be upgraded from a version before 11.2.1.35
  - This version can upgrade all Fusion 11 versions to the current release
- Fixed an issue for when there is more than one asset in a room for Fusion EM
- Fixed a memory leak
  - Memory leak occurred when bad device programs send excessive improperly formatted XML

Known Issues and Behaviors

- Nothing has changed since 11.2.0012.0067

Version 11.2.0012.0067

Version 11.2.0012.0067 is a public release.

Changes since Last Version

New Features

- Scheduled actions
  - Addresses the request to add the same action multiple times to the same meeting using different offsets.
- Proxy support – additional behaviors added for proxy support:
  - Proxy support for accessing scheduling providers is now available for on-premises installs.
  - Local requests will not go through the proxy.
- Fusion API - symbol rediscovery is now supported via the API
  - The Fusion API includes a new API call that starts re-discovery of the symbol that is linked with the room.

Security fixes:

- Remove Duplicate contacts – fixed an issue where duplicate contacts are found in the database

Bug fixes:

- Fixed an issue where the Regex rules for email string triggers were not working.
  - Fixed Regex for the attribute email rules for serials, and the forwarding rules for serials.

Known Issues and Behaviors

- The Fusion user will not be able to add steps to Actions if the total number of attributes in the Fusion instance exceed 4000.
- Attribute subfolders are not shown under the status tab for monitoring on the Room Details screen.
- Page not found error is displayed while adding people to bulk room edits when adding to 100+ rooms.

Version 11.2.0012.0067

Version 11.2.0012.0067 is a public release.

Changes since Last Version

New Features

- Scheduled actions
  - Addresses the request to add the same action multiple times to the same meeting using different offsets.
- Proxy support – additional behaviors added for proxy support:
  - Proxy support for accessing scheduling providers is now available for on-premises installs.
  - Local requests will not go through the proxy.
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- Attribute subfolders are not shown under the status tab for monitoring on the Room Details screen.
- Page not found error is displayed while adding people to bulk room edits when adding to 100+ rooms.

Version 11.2.0010.0022

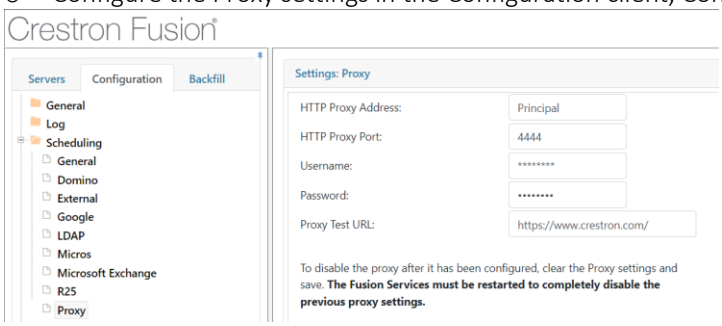
Version 11.2.0010.0022 is a public release.

This release includes proxy support for outbound requests from Fusion to a scheduling cloud service.

Changes since Last Version

New Features

- Proxy support – Fusion can be configured to direct all outbound scheduling requests from the groupware service to go through a proxy server.
    - This is for on-premises versions of Fusion only.
    - Configure the Proxy settings in the Configuration client, Configuration tab, Scheduling:



Security fixes:

- Several security related fixes have been implemented.

Bug fixes:

- Fixed an issue where R25 calendars don't appear on panel after UTC midnight.
- Fixed an issue where recurring meetings in rooms using the internal Fusion calendar are duplicated on the Scheduling tab.
- Fixed an issue where the log size rules are being ignored for the Schedule Service log file, leading to the drive space being consumed.
- Fixed an issue with the tree search feature where results are missed for groups or rooms that are level 2 or more down in the hierarchy.
- Fixed an issue where users are unable to drag the selection box when creating a new meeting, leaving only 30 minutes selected.
- Fixed an issue where the RoomView Monitoring "Page Load Error" appears for non-admin users when Windows Authentication is set.

Known Issues and Behaviors

A room update exception is seen if the room multi-edit is updated with blank text box.

Version 11.2.0009.0029

Version 11.2.0009.0029 is an internal release for select customers.

This release includes proxy support for outbound requests from Fusion to a scheduling cloud service.

Changes since Last Version

New Features

- Proxy support – Fusion can be configured to direct all outbound scheduling requests to go through a proxy server.

Version 11.2.0008.0049

Version 11.2.0008.0049 is a public release.

This release includes jQuery and jQuery UI upgrades, support for MS Graph delegation access, and some fixes for field issues. Fusion is now certified for Windows Server 2022.

Changes since Last Version

New Features

- All Crestron Fusion web pages are updated to use jQuery UI v1.13.2, compatible with jQuery 3.6.0. This brings improvements to drag and drop, date picker, select, and toggle operations.
- Crestron Fusion® software supports configuration for Microsoft Graph using either application or delegate access. The configurations given in Crestron Fusion will align with Microsoft Azure settings. This allows Crestron Fusion to connect to O365 using the MS

Graph protocol with either application permissions or with delegated permissions to the resource mailboxes.
- Support for Windows Server 2022 standard or enterprise version.

Improvements and Fixes

- A new API function is added to trigger a symbol rediscovery in an existing room
- Fixed an issue with the "Meetings by Room Report" showing incorrect values due to duplicate data entries in the database.
- Improved the actions feature with the ability to support 250 steps in an action. Actions with many steps will process without skipping when used in a scheduled event or meeting.
- Fixed several security issues regarding meeting data
- Fixed an issue regarding failed guest actions when using a Micros connection set
- Fixed an issue where sub notes in the Monitoring Rooms tab attributes tree were not visible
- Fixed the external links in an email template, which are broken if template is updated
- Fixed several Reporting issues where incorrect dates are displayed in EM reports when using custom date range
- Fixed a Reporting issue where the date range is reset after selecting Show Settings
- Fixed the drag and drop functionality when dragging action steps to a meeting offset
- Users can now create ad hoc meetings in a different room from a touch panel running Crestron Scheduling using the find function, when the target room is on a different server
- Fixed several interface issues in the Fusion EM client
- Fixed an issue with the Online Status History report showing data outside of the selected date range
- Fixed an issue where the service due date is not updated when the user marks a room as serviced.

Known Issues and Behaviors

- If duplicate steps are included in a meeting offset action, only the first instance will trigger. Duplicates will not trigger. Users will not be able to trigger duplicate actions configured for the meeting in Monitoring web client.
- The eControl tab intermittently displays infinite nested Fusion login screens rather than the control system login while launching CH5 XPanel in the Fusion iFrame. A refresh will clear this issue and load the expected control system login.
- A CH5 XPanel is loaded in Fusion eControl, but not does not connect with the VC4 program

Version 11.2.0007.0141

Version 11.2.0007.0141 is a public release.

The primary focus of this release includes library upgrades for all pages within the Crestron Fusion application, including both jQuery and Telerik libraries. Crestron Fusion now uses jQuery 3.6.0 providing a more secure and robust user experience.

Changes since Last Version

New Features

- All Crestron Fusion web pages are updated to use jQuery 3.6.0
- The Telerik library for reporting is updated to version 15.2.21
- Outbound Bulk Symbol discovery (Limited to Control Systems and AVF devices)
    - This feature provides the capability to discover maximum of 500 devices. Time to complete the operation varies based on the room symbol count.
    - It is recommended to discover no more than 50 devices at a time for the best results. The table below shows the approximate execution times based on the bulk device count:

No. of Devices	Time of execution
50	30min
100	1hr
150	1hr 30min
200	2hr
500	5hr

    - Maintain the same login credentials for the devices given in bulk symbol discover list or the process will fail to discover the devices.
    - Format the list using a Notepad (*.txt) file containing IP addresses or hostnames for discovery. I mix of IP addresses and hostnames is supported.
    - Foreign language translation support is not available for all alert messages related to this feature.

Known Issues and Behaviors

- The jQuery library upgrade to version 3.6.0 in this release does not include the jQuery UI version upgrade
- Fusion runs jQuery UI version 1.12.1. The jQuery UI will be upgraded to 1.13.0 in a future release.

- Backfill - Users need to expand the node or sub-node when selecting rooms to add backfill. Selecting parent node does not automatically select the collapsed child nodes and rooms.
- Special characters such as <, /, >, <>, ^ are automatically removed from room names, meetings, and report titles
- Time clock events in Energy Management cannot be saved in a foreign language or with special characters.
- Sub-nodes for attribute views are not displayed in the monitoring web client. Users will not be able to select attribute views from a sub-node of the" All Attributes" collection.
- Distribution Group names in the configuration web client do not support the < > characters. A page load error is triggered when attempting to use < > characters in the name string.

SAML Integration

- User must specify "default.aspx" at the end of the URL when using the load balancer as the SAML URL. The load balancer does not have a default web site associated, so it does not automatically redirect to "default.aspx".
- The configuration manager does not validate the SAML XML metadata. Ensure it is correct when you paste the Metadata.

Improvements and Fixes

- Fixed an issue where the rooms assigned to the Group That Will Not Be Loaded do not appear in the right pane.
- Fixed an issue when rediscovering a non-authenticated processor, Fusion is prompting the user for credentials.
- The field size for the eControl URL and the webcam URL is increased to support 2048 characters.
- Added an enhancement to support eControl pages hosted on a 2-series processor after the new HTML5 Web XPanel Authentication methods were introduced in 11.2.6.
- Corrected the reported versioning in the Fusion 11 installer.
- Fixed an issue where an upgrade from 11.2.3 to a later version would produce duplicate meeting entries.
- Fixed an issue where a long subject in an email notification was missing from the outgoing message.
- Fixed an issue where attributes were not displayed if a scheduling panel is deleted from a room with a symbol.
- Fixed an issue where the use of special characters in a report title would cause the report to fail.
- Fixed an issue where meeting related email alerts fail when using the Graph API with the O365 scheduling provider.

Version 11.2.0006.0063

Version 11.2.0006.0063 is a general public release.

Changes since Last Version

New Features

- **Identity Provider Support using SAML integration -** allow SSO user access to Crestron Fusion
    - Tested with Okta and Azure AD
    - Compatible with other identity providers that support the SAML protocol
    - New Reference Guide: SAML Sign-On for Crestron Fusion Software https://help.crestron.com/fusion/Content/Topics/SAML-Sign-On/Introduction.htm
    - There is no logout button for SAML installations. Close the browser to close the session and remove the session cookie.

- **Support for new HTML5 Web XPanel Authentication**
    - HTML5 Web XPanels require compatible firmware versions for 3-series, 4-series, and VC-4. Check the corresponding product pages for specific supported versions
    - HTML5 Web XPanels run in the eControl iFrame within the Fusion Monitoring web client
    - HTML5 Web XPanels connect seamlessly to the processor using token-based authentication
        - HTML5 Web XPanels will work in previous versions of Crestron Fusion but will require users to enter username and password multiple times to establish the control processor connection
    - The Mobility license is not required when launching HTML5 Web XPanels from Crestron Fusion
    - Check the HTML5 Web XPanel release notes and product pages for additional details regarding the usage and deployment of HTML5 Web XPanels

Known Issues

- The Crestron Fusion installer is misreporting the Fusion version as Version 10.
- When upgrading a Fusion instance that includes rooms with internal RoomView calendar meetings, duplicate meetings intermittently may appear on the calendar for recurring instance meetings. This is only a visual artifact in the Fusion web client and does not affect the meeting data for reports or for Crestron Scheduling panels.

- Only one symbol is being discovered when there are programs in multiple slots on a control system. Contact fsg@crestron.com for a patched version if needed. This is addressed in version 11.2.7.

Improvements and Fixes

- Security:
  - SQL Injection – closed 3 vulnerabilities
  - Cross-Site Scripting - closed 5 cross-site scripting vulnerabilities
  - Closed a vulnerability regarding open redirect attacks
  - Removed some retired web pages that are no longer used in the Crestron Fusion application
- Fixed an issue where Graph API schedule requests fail when day of the month is greater than 12
- Fusion Attribute forwarding now handles '204' response codes as well as '200' response codes.
- Fixed an issue with meetings created from Lotus Notes Client not appearing on the scheduling panel unless you browse to the room from the web client
- Fusion rooms configured for R25 can now convert times east of UTC
- Micros Using Connection Sets – Fixed an issue where the Action does not fire when the Guest Count reaches 1 or 0
- Fixed an intermittent condition where the Monitoring web client does not load completely and shows a blue screen

Version 11.2.0005.0074

Version 11.2.0005.0074 is a maintenance release.

Changes since Last Version

New Features

- The Micros connection now supports TLS 1.2 encryption.
- The Azure AD federated service login has been improved to support logins from users with more than 500 groups.
- Implemented a feature to synchronize check-in events across multiple scheduling panels in a room. When a check-in is performed on one panel, the other panels in the room are made aware of the event and therefore mark the meeting as attended.

Conditional Release

The GCC-High endpoint for Microsoft O365 calendars is not tested. Do not use this build for GCC-High applications. GCC-High will be officially supported in a future release.

Known Issues

- The Google meeting warning email received by the meeting organizer displays the incorrect meeting start, end time, and duration.
- In some cases, a forms authenticated user will see a page load error on the first login.
    - A second login attempt will work after first receiving the error.
- Some help links are broken in the Fusion EM client.
    - Users can always reach the help files directly using the main menu shade or at help.crestron.com.
- For a room with a processor (symbol) and a scheduling panel, if the panel is deleted, the attributes will disappear from the monitoring web client.
    - Remove the panel from the room before deleting it from Fusion.
- When using connection sets with Micros, actions will not fire including check-in and check-out actions.
    - Setting up rooms directly not using connection sets works as expected.

Improvements and Fixes

- Added some missing Txx-x70 drivers
- Fixed an issue that was causing some reports to throw an error regarding an invalid object
- Fixed an issue where the Device Usage by Meeting report threw an out-of-bounds error when filtered for non-business hours
- Corrected several report formatting issues
- Corrected an MS Graph issue where the recurrence for every weekday was not working
- Corrected an MS Graph issue where the recurring series was not getting removed for no show
- Fixed several Accessibility formatting issues in both Setup and Monitoring
- Corrected an issue where Exchange 2019 and Exchange 2016 fail to verify (but still connect and retrieve schedules)
- Fixed an issue where a scheduling panel in a room using R25 would decline Ad-Hoc meetings
- Fixed an issue where the search field on the Attributes Tab provides the wrong results

Security

- Fixed a vulnerability to Stored Cross-Site Scripting in the Help Request and Instant Message areas of the Monitoring web client
- Fixed a vulnerability that allowed privilege escalation in the Help request tab
- Corrected an issue where the Fusion server set the X-Frame-Options SAMEORIGIN response header twice

Version 11.2.0004.0040

Version 11.2.0004.0040 is the first public release to include support for MS Graph with O365, including Relay support. Accessibility support for the Crestron Fusion setup web client is complete.

ADA Compliance for accessibility uses standards described by W3C, the Web Accessibility Initiative (WAI) https://www.w3.org/WAI/fundamentals/accessibility-intro/

Web accessibility means that websites, tools, and technologies are designed and developed so that people with disabilities can use them.

Changes since Last Version

New Features

- Microsoft Graph for O365: Users shall have an option to connect a room with its O365 calendar using Microsoft Graph. This option shall be included in the available list of scheduling providers and supported with connection sets. The following methods are supported:
    - Relay method
    - Webhook method
    - Poll method
- ADA Compliance (Accessibility) for the Setup Web Client
    - Focus Indicator: The Fusion user interface shall have a mode of operation where the keyboard focus indicator is visible. The element on the web page that has the keyboard focus shall be clearly highlighted to demonstrate this focus.
    - Screen Reader Interactive Elements: Interactive elements shall have clearly defined names and states, including assistive technologies like screen readers.
    - Keyboard Focus: All actionable items on the interface shall be reached using tab or arrow keys, or a combination of those.

Known Issues

- Screen reader software is not able to read Close buttons in the setup web client
- Grid controls are not accessible when using keyboard navigation in the setup web client
- When language is set to non-English, recurring meetings cannot be created using the end by date recurrence pattern.
    - Customer Impact: End user will not be able to book recurring meetings with an end-by-date pattern in local languages.

Version 11.2.0003.0109

Version 11.2.0003 introduces support for MS Graph with O365 and continues accessibility support for Crestron Fusion web clients. This release is available on request only for customers that require MS Graph support.

For accessibility, this release has a partial update to the Setup web client, using standards described by W3C, the Web Accessibility Initiative (WAI) https://www.w3.org/WAI/fundamentals/accessibility-intro/

Web accessibility means that websites, tools, and technologies are designed and developed so that people with disabilities can use them.

Changes since Last Version

New Features

- Microsoft Graph for O365: Users shall have an option to connect a room with its O365 calendar using Microsoft Graph. This option shall be included in the available list of scheduling providers and supported with connection sets.
- External Documentation: External document references shall be available to add in the existing asset document dialogues in Documents tabs in the Asset and Room Details dialogue.
- Asset Local Web Setup Entry: Fusion user shall launch the asset's local web interface by clicking the link in the asset details record.
- Focus Indicator: The Fusion user interface shall have a mode of operation where the keyboard focus indicator is visible. The element on the web page that has the keyboard focus shall be clearly highlighted to demonstrate this focus.
- Screen Reader Interactive Elements: Interactive elements shall have clearly defined names and states, including assistive technologies like screen readers.
- Keyboard Focus: All actionable items on the interface shall be reached using tab or arrow keys, or a combination of those.

_____Do Not edit below this line _____

Version 11.2.0002.0130

Version 11.2.0002.0130 introduces the accessibility support for Crestron Fusion web clients. Specifically, this release has an update to the Monitoring web client, using standards described by W3C, the Web Accessibility Initiative (WAI) https://www.w3.org/WAI/fundamentals/accessibility-intro/

Web accessibility means that websites, tools, and technologies are designed and developed so that people with disabilities can use them.

Changes since Last Version

New Features

Accessibility applied to Fusion Monitoring

Accessibility changes include:

- Focus Indicator is darker and more visible. This indicator can be disabled in the user's profile settings.
- Interactive elements on the page have clearly defined names and states that can be announced by a screen reader.
- All actionable items in the interface are reachable using keyboard navigation, including tab key, arrow keys, space bar, enter key, etc.

Accessibility support in this release is applicable only for the following tabs and sections in the Monitoring web client:

- My RoomView tab
- Assets tab
- Rooms tab
- Schedule tab
- User Profile
- Room booking wizard
- Tree View
- Navigation shade
- Apply Action drop-down

Support for the Crestron Connected Version 2

Fusion 11.2.0001 added support for the new Crestron Connected Version 2 SDK available to third party manufacturers. Version 11.2.0002.0130 adds a new AVR driver. CCV2 devices can initiate connections to Fusion and are compatible with Crestron's Fusion in the Cloud service.

Report Readiness Tool

Version 11.2.0002.0130 adds the Report Readiness Tool, part of the Fusion Dashboard distribution, to the Configuration Manager Tools, making it readily available from the Configuration Manager.

Enhanced Search

A search filter is now available for Rooms and Folders in the navigation trees in the Fusion monitoring, setup, and EM web clients

- The search filter text box and controls are added above the trees.
- The search filter modifies the tree display to only show rooms and nodes that contain the filter value.
  - The filter value will be highlighted in the rooms' and nodes' titles.
- The filter is removed from the tree when cancelled by the user and the tree is restored to its unfiltered state

Global Filter Enhancement

Filters on Assets and Rooms tabs can be defined as "global" so all Fusion users with access to those tabs can see them.

- When adding a filter, there is an option to save as a global filter.
- Only a Fusion Administrator can add, delete, or update a global filter, but all users will see the filter.
- There is a visible indicator in the drop-down filter list to distinguish global from user filters.

Known Issues

- Web client
  - Some pop-ups intermittently take more than 30 seconds to load on the first attempt.
- Accessibility –
  - MacBook reader is not always reading the column name
  - The NVDA screen reader is reading outside of the Room Booking Wizard window
  - Microsoft Edge only – the NVDA reader will not allow moving to the Next Tab on the user profile page

- Scheduling –
    - If the scheduling application is enabled for Decline for No Show, recurring meeting counts will be reset when the Fusion services are restarted for any reason
    - The decline for no show feature does not work for recurring R25 meetings
    - Sometimes the meeting series for a Domino recurring meeting created from the Notes client is not removed after a 3rd strike
    - By design, Domino meetings created from the Notes client should not be editable from Fusion. For meetings created from the Notes client, meeting parameters should be grayed out in the Fusion scheduling page. Since they are available, users may try to edit these fields, but the records will not be updated in Notes.
- Reporting
    - Meeting No Shows and Meetings by Room reports will not show correct information for Domino meetings that are declined
    - The Device Usage Totals report will produce an error if the room names contain non alpha-numeric characters like "|" pipe.
- Configuration
    - Server weights assigned to the servers in a group are not applied correctly
- Performance
    - Rooms may not come online when Fusion is processing heavy signal traffic. Benchmarks will be published in an upcoming release.
        - Tests were conducted with signal rates at about 300,000 signals per hour per server. This is far above a typical deployment which would typically have less than 100,000 signals per hour per server.
- Security
    - In some cases, depending on browser settings, closing the browser and reopening may restore the Fusion session without requiring authentication.
        - Browser settings that allow this (change these settings to false to prevent):
            - In Chrome settings: Settings -> On Startup -> Continue where you left off (is set to true)
            - In Firefox settings: Options -> General -> Startup -> Restore previous session (is set to true)
- Other
    - People cannot be deleted from Fusion after the license agreement has been accepted
        - A Fusion Administrator can change the user to "Inactive" to prevent login to Fusion

Improvements and Fixes

- Fusion Interactive Help files have been updated for the Monitoring web client on help.crestron.com

- Scheduling -
    - Google meeting behavior now works like Exchange/O365 – no show meetings are truncated to reflect the time the room was booked
    - Added support in Domino for excessively large user DB's
    - Fixed an issue where an O365 mailbox does not verify when using a connection set
- Reporting –
    - All scheduled reports will produce the same data as the corresponding on-demand reports in the web client.
- Security
    - Added validations to prevent HTML injection

Version 11.2.0001.0035

Version 11.2.0001.0035 (release 10) is the tenth in a series of Crestron version 11 Fusion releases. This release adds support for Microsoft Windows Server 2019, Microsoft SQL Server 2019, and Microsoft SQL Express. New drivers and support for the Crestron Connected Version 2 (CCV2) third party devices is included. Please note the version numbering has changed from 11.1 to 11.2, but this is still the same core release as 11.1.

Changes since Last Version

New Features

Support for the latest Microsoft Server and SQL Versions

- Microsoft Windows Sever 2019 - Crestron Fusion is compatible with Microsoft Windows Server 2019.
- Microsoft SQL Server 2019 - Crestron Fusion is compatible with Microsoft SQL Server 2019 Standard and Enterprise Editions.
- Crestron Fusion supports installation and operation with Microsoft SQL Server Express 2017 and 2019 for non-production environments only. At installation time, the user must specify that SQL Express is being used and the notifications will appear throughout the installation process and the Fusion web clients.

Support for the Crestron Connected Version 2

Fusion 11.2.0001 includes support for the new Crestron Connected Version 2 SDK available to third party manufacturers. Two drivers have been added, one for CCV2 Projectors, and one for CCV2 Displays. The big change here is that CCV2 devices can initiate connections to Fusion. They are compatible with Crestron's Fusion in the Cloud service.

Known Issues

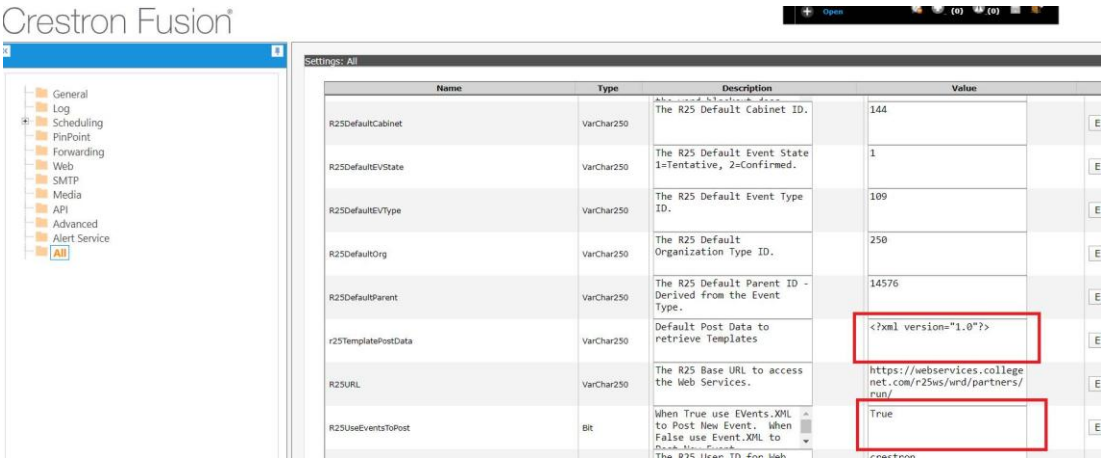
- Scheduled reports created in a previous version will not run after the upgrade. Existing scheduled reports cannot be edited. It will not be possible to create new scheduled reports. A patch is available on OLH
- Sometimes scheduling panels do not show calendar information when using the O365 provider. This may also be accompanied by failures when attempting Reserve Now.
- Room Booking Wizard – choosing "all regions" causes a timeout and slow response from the web client. Workaround – adjust the scope of the search.

Improvements and Fixes

CollegeNet Update

Added support for the latest CollegeNet updates to 25Live/R25

- Both the original and new methods are supported
- On an upgrade, the original method will be in place
- To set the new method, the following All Config parameters must be set
    - R25TemplatePostData must be blank
    - R25UseEventsToPost must be True



Security

- Fixed issues where the Crestron Fusion application is vulnerable to Cross-Site-Request Forgery attacks.

Fusion API

- Fixed an issue where action meetings could not be created using the Fusion API

My RoomView Monitoring Tab

- Rooms assigned to the "Group that will not be loaded" will now appear in the "Offline and Partially Online" Rooms list in the My Room view Tab.

Version 11.1.9000.0066

Version 11.1 R9 (release 9) is the ninth in a series of 11.1 releases. This release adds several new features, including Scheduling Connection Sets, Log File Size Management, and new Security Policies. This release also includes the updates of the Crestron Fusion contextual help files.

Changes since Last Version

New Features

Documentation Changes

Fusion 11.1.9000

The following existing documents are merged with the Crestron Fusion Contextual Online Help so that all information is in the same place:

- Doc. 7892E Installation Guide for: Crestron Fusion® Software for SW-FUSION
- Doc. 7908C Reference Guide for: Crestron Fusion® Software Configuration for SW-FUSION
- Doc. 7886E Integration Guide for: Configuring Crestron Fusion® Software with Google Calendar™ Application for SW-FUSION
- Doc. 8459A Federated Single Sign-On for Crestron Fusion® Software
- Doc. 8422A Configuring Modern Authentication for EWS in Crestron Fusion® Software

The following existing document is updated, but remains as a standalone document:

- Doc. 7898D Reference Guide for: Crestron Fusion® Software SSI Module Programming for SW-FUSION

In addition to being included with the Crestron Fusion software, Crestron Fusion Contextual Online Help is now available on https://help.Crestron.com

Scheduling Connection Sets

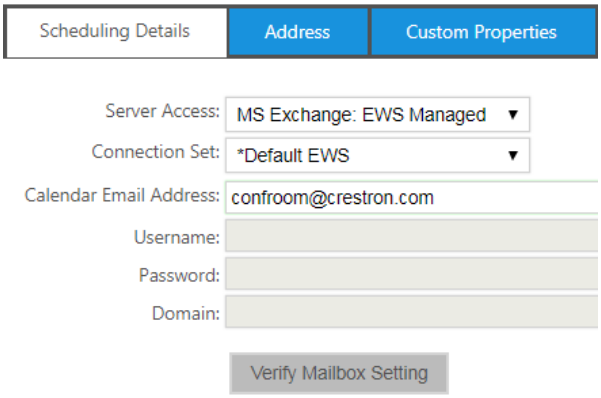
Fusion 11.1.9000 adds support for Scheduling Connection sets. Connection sets encapsulate all the access parameters necessary to establish an authenticated connection to a scheduling provider. Some of the things that will be in a connection set include:

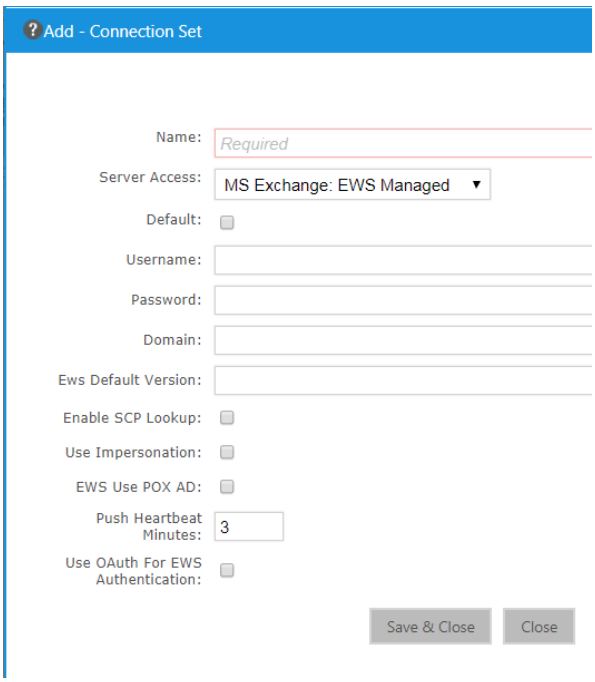
- Username/password
- Impersonation option
- Server or URL

An additional drop-down selector is available on the scheduling to permit a Connection Set to be selected. The Connection Set may provide complete or partial parameters for access to a calendar for a room. The calendar identifier - typically an email address – is still typically required to enter individually in each room. Anything entered specifically in the room details window overrides the equivalent parameter in the Connection Set. There are additional parameters in the Connection Set that override global values previously specified in the Scheduling tab or configuration All Config parameters, for example, the EWS impersonation option.

Connection Sets are associated exclusively with a particular provider type, but not all provider types have them. Here's the list of GroupwareProviderTypes that use Connection Sets:

- EWS Managed
- Google
- Micros
- External





<u>The Default Connection Set</u>

Each provider type may have one connection set that is its default set. Default connection sets are created on an upgrade from a previous Crestron Fusion version based on existing scheduling provider settings.

When creating a new connection set, check the box on the edit screen to indicate the set is the default.

<u>Order of Precedence</u>

For some of the parameters there will now be three locations where their values may be set:

1. Room details, Scheduling tab
2. Connection Set
3. Config variables

In order to prevent confusion, the follow business rules applies to how a room is defined and its connection information is determined:

1. If a room is defined with a Connection Set of NONE, then its parameters are determined in the same way they were prior to R9, i.e., if something is missing from the room's definition, e.g., username, then Fusion will look for a corresponding default value in the configuration.

2. If a room is defined with a Connection Set other than NONE, then its parameters are obtained by using whatever is in the selected Connection Set and filled-in or overridden by whatever is in the room definition. No reference to configuration variables is made.

<u>Other</u>

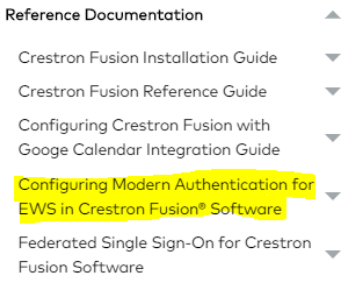
Support for Connection Sets is included in the Crestron Fusion API, the Service Controller, and in the room templates dialogues.

For multi-edit room details, selection of a Connection Set is only allowed if all the rooms selected are of the same provider type, and that provider type supports Connection Sets.

Improvements in Modern Authentication (OAuth for EWS)

Fusion 11.1.9000 improves the Modern Authentication implementation introduced in 11.1.7000. These new methods include the ability to add a scope to the EWS integration, limiting calendar access to specific resource calendars. Instructions for the new methods are available in the Crestron Fusion Contextual Online Help files included with R9 (11.1.9000.0066). The Crestron Fusion help files are also available on https://help.Crestron.com.

Locate the “Configuring Modern Authentication for EWS in Crestron Fusion Software” document in the Reference Documentation section of the help file.



Log File Size Options

Fusion 11.1.9000 introduces options to split logs based on a user specified size. Log splitting is disabled by default with an option to enable. Setting the Maximum Log Size to something other than “0” enables log splitting. For example, set to 512 to limit the logs to a size that can be opened by Notepad.

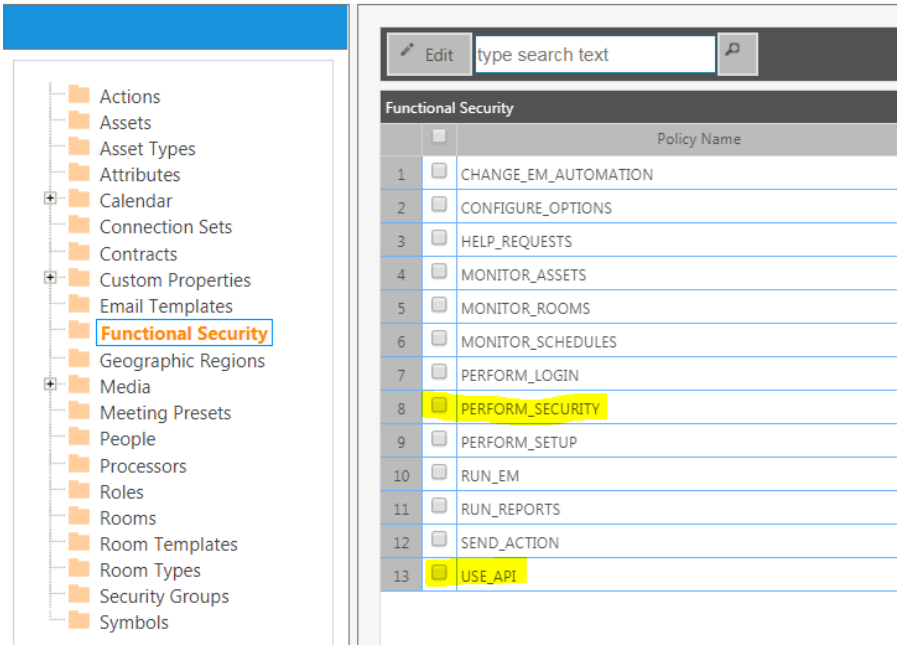
New Functional Security Policies

A new "Security" security policy authorizes user access to Functional and Object security in the setup web client.

- Only users authorized by this policy, or administrators, are able to modify functional and object security.
- Members of the Administrator group shall still be able to modify security policies.

A new security policy shall authorize use of the Fusion API

- Only users authorized by the API Policy shall have access the Fusion API service.
- Crestron Fusion API users must include credentials of a valid Fusion API user account
- API Users are validated regardless of the Fusion installation mode (Forms, Windows, Azure AD)



Improvements and Fixes

Security:

- Added mechanism to prevent a cross-site scripting issue
- Added a special characters block on the search fields to prevent possible Reflected Cross-Site Scripting attack
- Blocked the ability of users to access certain logs using a web browser without authentication
- Fixed an issue that allowed a standard users to access areas restricted to admins

Monitoring:

- Fixed an issue where the Monitoring Asset Tab shows no data when an analog Attribute has the same Max value and Min value
- Fixed some issues in the Monitoring Asset tab where the grid and/or data in the grid disappears
- The items per page options now include 100, 200, and 500
- Alignments for buttons and some controls have been adjusted for consistency through the web clients

Scheduling:

- Fixed an issue where a meeting displayed on a scheduling touch screen shows the wrong organizer
- Organizer will get email alerts for meetings created from 25Live (R25) provider.

Fusion API:

- Fixed an issue where Adding/Changing the groupware password using the API fails
- Modified the API to return the parent node
- Removed a requirement for Custom Field information in a PUT operation

Reporting:

- Fixed an issue where the asset report shows the purchase date one day behind
- Decline for No Show Report cleared up some confusing column names

Setup:

- Modified the multi-edit dialogue for the processors object to include UserID and Password

Configuration – Multi-Server Environments:

- Improved the process for adding a new server to an existing Fusion deployment. Bringing on a new server no longer requires a restart of all servers in the deployment, or a restart of all Fusion services in the deployment
- Multi-server environments no longer send duplicate licensing notifications
- In a multi-server environment, fixed an issue where configuration changes made on one server were not picked up by the other servers
- Fixed an issue where a server in a multi-server environment might pick up more rooms then the max rooms per server allowance

Known Issues

- Sometimes scheduling panels do not show calendar information when using the O365 provider
  Recover: restart Fusion services
- Sometimes user cannot reserve meeting on a panel when using the O365 provider

Both of these known issues are due to abnormal latency on Exchange 365 provider. Issues are resolved when the response times from O365 return to normal, but a Fusion service restart may be required.

Version 11.1.8000.0048

Version 11.1 R8 (release 8) is the eighth in a series of 11.1 releases. This release allows Crestron Fusion to integrate with Azure Active Directory, allowing users to authenticate with their own corporate credentials. A new manual is available documenting the Azure AD integration steps - Federated Single Sign-On for Crestron Fusion® Software (Doc. 8459A), along with several other new features and some bug fixes.

Changes since Last Version

New Features

Integration with Azure Active Directory

Fusion 11.1.8000 supports User Integration with Azure Active Directory to allow Federated Single Sign-on. This allows users to log in with their domain credentials when using Fusion-in-the-Cloud deployments. For instructions, see DOC. 8459A, available on the Fusion feature page.

Enhancements

Monitoring – Apply Actions Drop-down

- The Monitoring web client Actions drop-down now includes an OK/Cancel dialogue before submitting the Action to the selected room(s).

Crestron Fusion API

- The Fusion API now provides access to stored data for device usage, system usage, display usage, occupancy, attribute changes, help requests, and custom logging data.
- The Fusion API now supports the ability to initiate symbol discovery.

Logging - Performance Monitor (PerfMon) Support

- Additional data points are available to Perf Mon.
- The Crestron Fusion 11.1.8000 installer defines the new counters. Launch Performance Monitor and select the counters you want and start tracking.
- The new data points including the following:

Fusion_DataServiceWin

- Average SQL non-query time
- Average SQL query time
- Non-Query rate
- Query rate
- Total Non-Queries
- Total Queries

Fusion_LoaderService

- Data Service Ping Errors
- Data Service Pings
- Database Notification Rate
- Database Notifications

Fusion_LogService

- Attribute Log Entries
- Attribute Log Entry Rate
- Error Log Entries
- Error Log Entry Rate
- Log Text Log Entries
- Log Text Log Entry Rate
- Signal Log Entries
- Signal Log Entry Rate
- Usage Log Entries
- Usage Log Entry Rate

Fusion_RouterService

- Analog Signal Rate
- Analog Signals
- CIP Connection Rate
- CIP Connections
- CIP Disconnection Rate
- CIP Disconnections
- Digital Signal Rate
- Digital Signals
- Serial Signal Rate
- Serial Signals

Improvements and Fixes

Auditing:

New Event codes in the Event Viewer audit trail:

UserLogin	2000
UserLogout	2001
UserSecurity_UserCreate	2002
UserSecurity_UserAssign	2003
UserSecurity_UserUpdate	2004
RoomSecurity	2005
DeviceConnect_Success	2006
DeviceConnect_Failure	2007
RoomDelete	2008
NodeDelete	2009
ManualAction	2010
ErrorAlert_UserDismiss	2011

Device Monitoring:

- Fixed an issue where Crestron Fusion was not properly tracking the online/offline state when connecting to the RoomView 6 symbol.
- SQL Outage - In the event of a SQL outage due to maintenance or other issues with the SQL environment, the connected rooms will return online when SQL service is restored. Previously, this would require a reboot of the Fusion services. Fusion services may still require a restart for extended SQL outages.

PinPoint:

- The PinPoint app is now sending an Authorization header, enforced by the iOS operating system. The Fusion CEMA service is modified to handle this new header from PinPoint.

API:

API Security is required when using the Fusion API and running Crestron Fusion in Windows Authentication mode. When setting the Fusion API options in the Configuration web client, the option for using the API in a non-secure mode is disabled and greyed out.

- Fixed an issue where the returned value LastModified date was incorrect on the Get Many Rooms function. This is important for PUT operations where the last modified field is required.

Monitoring:

- Tab Switching - Improved the tab assembly on the monitoring page to allow seamless switching between the e-Control and the WebCam tab without displaying a white screen

Scheduling:

- Fixed an issue using Decline for No-Show with multiple panels in a room where Fusion would generate multiple emails, one for each panel, instead of just one for the room.

Fusion EM:

- Added validation of EM asset data to block historic records with missing or invalid Category and Sub-Category data, which, if added, cause the historic energy graphs to fail.

Reporting:

- Added a “Tomorrow” option to the date range filters
- Fixed report formatting on some reports when using the Hebrew language
- Add various formatting improvements for consistent behavior across browser types

Setup:

- Fixed a bug where Adding Geographic regions made buttons disappear on the "Add Node" dialogue
- Standardized Save & Close buttons and mandatory messages across all forms
- Made several alignment and formatting fixes for consistency across all forms
- Fixed functional security behavior regarding Help
- Fixed a broken links to the help documentation
- Fixed an issue where the Calendar password failed to save when adding rooms using templates

Known Issues

Scheduling Notifications:

In the case where users have enabled organizer role notifications:

- IBM Notes: the user will see multiple emails for meetings generated from either Fusion monitoring web client or the IBM Notes client when there is a decline for no show event.
- Google Calendar: The user will not receive a warning email when the second meeting in a recurring series is declined due to a no show
- CollegeNet R25/25Live: the user will not receive the booked meeting email for a meeting created in the CollegeNet environment

Installation:

- Sometimes the user will not be able to install the latest Fusion 11.1.8 build on a server that already has the same release. If it is necessary to reinstall 11.1.8, first uninstall the existing version and reboot the server.

Version 11.1.7000.0055

Version 11.1 R7 (release 7) is the seventh in a series of 11.1 releases. This release introduces support for O365 using Modern Authentication, and includes improvements to layout, alignment, and formatting,

Changes since Last Version

The Fusion installer now includes and installs .NET 4.6.2 Framework.

New Features

Support for O365 Modern Authentication

Modern Authentication is the Microsoft term for their implementation of the OAuth 2.0 authorization framework for client/server authentication. Modern Authentication uses Active Directory Authentication Libraries (ADAL) to enable applications like Crestron Fusion to send Access Token requests directly to the authentication provider instead of sending username and password to the resource.

Security

- Fusion supports outbound symbol discovery over SSH, with or without authentication enabled.
    - An issue using symbol discovery with 3-series processor firmware Version 1.503.0070.0001 and later that includes the SSH banner warning is fixed in this release.
    - Since CTP is off by default with this new 3-series firmware, traditional CTP discovery fails. Symbol discovery requires that the SSH option is checked.
- Fixed a possible cross-site scripting vulnerability when adding custom tabs

Enhancements

Support for Google meetings marked as “Private”

When a user marks a Google meeting as private, Fusion replaces the meeting subject and organizer with the word “Private” on the conference room scheduling panels.

Fusion EM and Renewable Energy

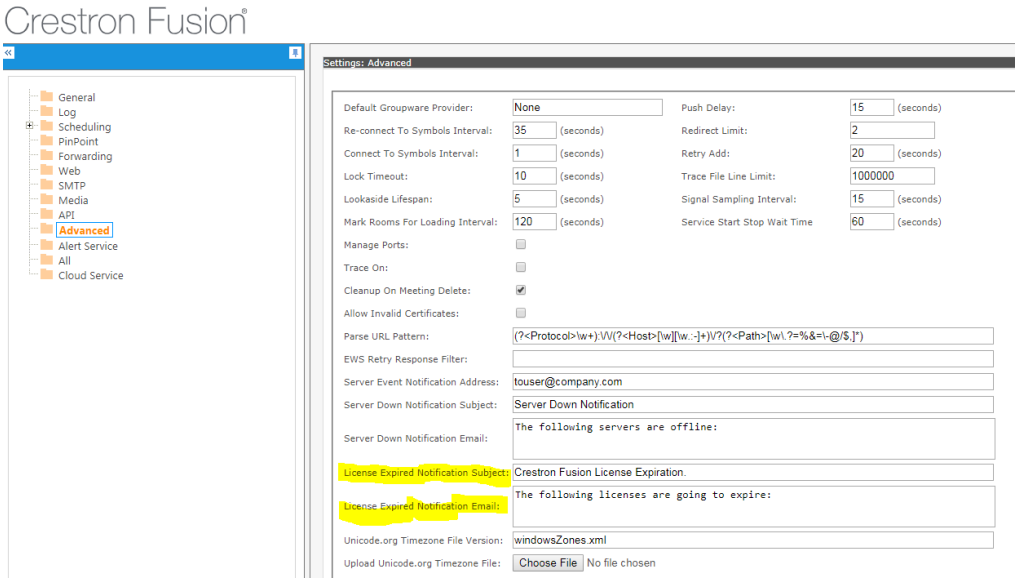
Fusion EM adds support for displaying renewable energy on the Real Time Energy Tracker and the Historical Energy Usage graphs. This feature presumes there is a renewable energy source available in the deployment and that the programming for tracking the output of the renewable energy source is in place.

Licensing

The Configuration web client now has additional fields for license expiration notifications including a customizable subject and message. The email addresses specified in the “Server Down Notification Address” field will receive the license notifications.

License notifications also appear in the web clients.

Fusion EM and Fusion RV web clients no longer require a separate license.



Drivers

New drivers include the TSW-560, TSW-560P, TSS-7, TSS-10, and UC-Engine.

Google

Fusion has modified the room add/setup form to allow entry of Google credentials at the room level. This is useful where multiple Google email domains exist on the same server deployment.

Note that verification prior to saving the record only works when the global Google settings have access to the room specified resource. For all other Google accounts, save the room record before verification.

Installer

Bug Fixes

Alert Service (SMTP):

- Fixed an issue where the alert service was not respecting the user defined SMTP port

API:

- Fixed issues with Room Get operations failing when the Time Zone offset is > 0
- Added the ability to return the parent node. When using the API to gather info about a specific room, the <ParentNodeID/> tag in the XML will now be populated
- Fixed an issue when performing a PUT operation to a room resource, if no custom field array is included in the request, a NULL reference exception is thrown

Web Client:

- Added performance enhancements when switching tabs in the monitoring web client
- Fixed several translation issues
- Fixed several alignment issues with buttons and labels across different browser types
- Fixed an issue with multi-edit only affecting the first two rooms

- Fixed an issue where the People search in setup only searches the current page in a multi-page result set. The People search now searches the entire list of people.
- Fixed an issue where some IFC files would fail to import
- Fixed an issue when edited security groups where the group name is incorrect and the group members are not displayed
- Fixed an issue where, in some cases, users are unable to select a graphic set when editing an attribute

Reporting:

Note that there are no forced restraints on report filtering. It is possible to select a large room count or large date range on a report that will cause the desired graph or visualization to be illegible. This can be mitigated by narrowing the scope of the filters or choosing the option to exclude the graphic from the report.

- Added shading to the organizers list in the Top Meeting Organizers report
- Fixed formatting and alignment issues various reports
- Fixed several formatting and alignment issues when running reports in different languages
- Fixed an issue where settings are lost on saved reports
- Fixed an issue where the date range could be missing from a generated report

Scheduling

- Added support for external calendars in Room Templates
- Fixed an issue where meetings made in the web client would lose the organizer
- R25
  - Fixed an issue where meeting data is corrupted when creating recurring meetings from the web client
  - Fixed an issue preventing the editing of a recurring preset meeting
- IBM Notes/Domino
  - Fixed an issue where a recurring Domino meeting series is not getting removed after 3rd strike on a decline for no show operation
  - Notifications – note that Meeting Warning and Meeting Update Emails are generated for the same meeting for DOMINO Rooms when meetings in a recurring series are declined for no shows.
- Google
  - Fixed an issue where Decline for No Show (D4NS) operations do not update the Google meeting although the matching emails are sent from Fusion
  - Fixed an issue where a reserve now operation from the scheduling panel intermittently fails
- Room Booking Wizard
  - Fixed an issue where a room is returned when it is booked by a future instance of a recurring meeting
  - Fixed an issue where 'Page Load Error' appears after selecting Equipment under the Resources tab
  - Fixed an issue were an available room is not returned in the search results

Registration

During a device registration, Fusion sends a list of servers available in the deployment for connection. In a multi-server environment, this list sometimes includes invalid servers. If the device attempts to connect to an invalid server, the registration process fails. This issue has been resolved.

Known Issues

The “Meeting Booked” notification from Fusion includes a link to modify Presets/Actions. The link is currently broken unless the user enters the FQDN for the server and domain in the webserver configuration variable.

Version 11.1.6000.0092

Version 11.1 R6 (release 6) is the sixth in a series of 11.1 releases. This release introduces support for Crestron VC-4, Virtual Control Server Software. This release also includes enhanced Alert Rollup, and reworks some of the Google and IBM Notes integrations. There are a number of bug fixes as well.

Changes since Last Version

Starting with 11.1.5000, a new install of Crestron Fusion no longer supports any connection without a license. The software requires a license to make any room connection. Five free licenses are available by request at fsg@crestron.com.

New Features

VC-4 Support

- VC-4 connects to Crestron Fusion using device-to-Fusion connections only.
- The VC-4 server appears as a single processor in Fusion that can support up to 500 rooms.
- The Fusion user experience for VC-4 rooms is identical to any traditional room created using a 3-series processor
    - Use the RoomView 7.2 symbol
    - Fusion inbound connections only
- IPIDs do not need to be unique across programs as in traditional multi-slot processors. VC-4 introduces a new parameter behind the scenes called “Program ID” that further identifies the room running on a VC-4 system. This is invisible to the user.

- **<u>Never</u> change the IPID or any other information on the symbol record in Fusion for a VC-4 room**

When connecting VC-4 rooms with Crestron Fusion, set the TCP Keep Alive on the VC-4 server to 30 seconds. Use the following procedure to set the TCP Keep Alive:

- Administrative permissions are required to change the values.
- Use SUDO when opening text editor from the command line.

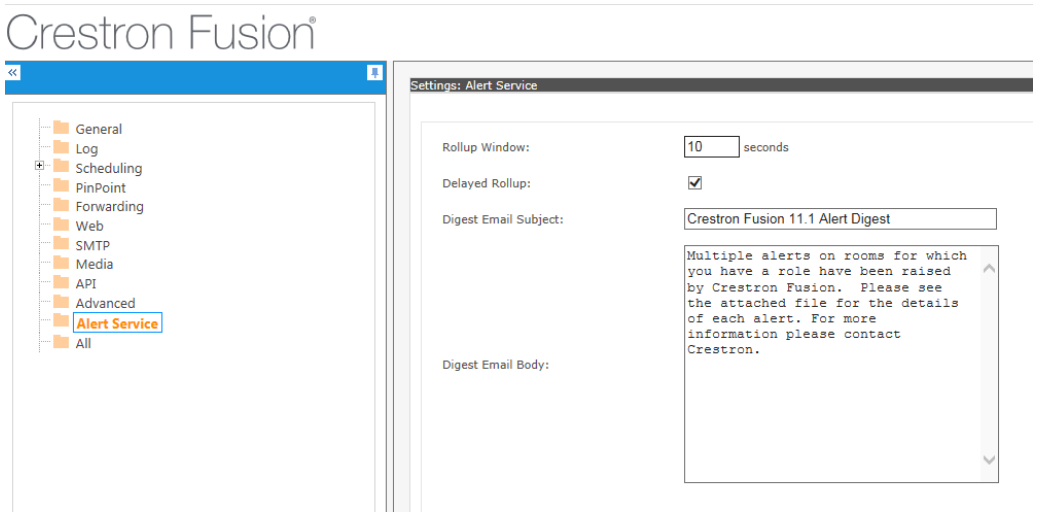
Set these values in the configuration file:

- net.ipv4.tcp_keepalive_time = 30 in /etc/sysctl.d/tcp_keepalive_time.conf file
- net.ipv4.tcp_keepalive_intvl = 30 in /etc/sysctl.d/tcp_keepalive_intvl.conf file
- Reboot the Linux server for settings to take effect.

Check the values after the reboot using command line:

- builduser@ubuntuVC4:/var/log$ cat /etc/sysctl.d/tcp_keepalive_time.conf
  net.ipv4.tcp_keepalive_time = 30
- builduser@ubuntuVC4:/var/log$ cat /etc/sysctl.d/tcp_keepalive_intvl.conf
  net.ipv4.tcp_keepalive_intvl = 30
- builduser@ubuntuVC4:/var/log$

Alert Rollup



- When multiple rooms within a node issue an alert, Fusion sends one digest email for the node.
- The single digest email has a .CSV attachment that includes:
  - The nature of each alert
  - The room impacted by the alert
  - The user cannot customize the format of the CSV file as can be done with traditional alert templates
  - The “columns” included in the .CSV file are as follows:

Name	Values	Notes

RoomOrAsset	'R' or 'A'	Indicates whether the notification was due to an attribute on a room (symbol) or an asset.
Time	Local Date/time	When the attribute came in.
UtcTime	UTC Date/time	When the attribute came in.
RoomName	From database	If an asset from a node, use the node name (rare).
AttributeName	From database	
AttributeType	'D' 'A' or 'S'	
AttributeValue	'0' or '1', number, or string	Value that caused the alert.
ProcessorName	From database	Only if Room notification
SymbolName	From database	Only if Room notification
Connection	IP Address or hostname	N/A for programmed assets
AssetName	From database	Only if Asset notification
Model	From database	Only if Asset notification
MACAddress	From database	Only if Asset notification

- There is a configuration setting called "Rollup Window" that accepts the number of seconds to wait before "rolling up" alerts and sending them to the user
- The default value for Rollup Window will be 0s (disabled – Alerts will behave as they always did)
- There is an additional configuration setting for "Delayed Rollup"
    - When "Delayed Rollup" is enabled, alerts are sent immediately unless 5 alerts are received within 60 seconds, at which point the user settable rollup window will be activated
    - "Delayed Rollup" will default to off
    - When "Delayed Rollup" is enabled, the "Rollup Window" value must be at least 10.
- The content of the lines of the digest email CSV will be no better or worse than the content of the single email. If a substitution is missing in the email, it will be empty in the CSV field.
- Configuration changes are picked up immediately, but may be delayed until the current rollup period expires.

Enhancements

Licensing

License management and room allocation has undergone extensive changes.
Licensed room counts are now enforced across multiple servers and a service restart is no longer required to detect a license expiration.

1. You must click on the Server Group Status button in the Configuration web client to see the actual room allocations in the right pane only. The left tree pane is inaccurate because it also counts nodes loaded.
2. There are three factors as to how many rooms a server will take: MaxRoomsPerServer (MRS), the license count, and the actual number of rooms in the group.
3. Every two minutes the Fusion loader service will check if there are more rooms to assign. On a configuration change to MRS, or the addition of rooms, it will take a few minutes for the new rooms to be picked up by a server and connected. It may take two or three cycles to pick up the last few rooms because the servers do not synchronize and try to determine a "fair share" of rooms without actually communicating among themselves. This is common when the number of rooms in a DB or the license count is not an even multiple of the number of servers and rounding comes into play.

4. If you change MRS downward, e.g. servers all have 20 rooms, but you set MRS to 15, the servers will not shed their excess rooms until a Rebalance is done. This is by design since rebalance involves disconnecting rooms, which is disruptive.
5. If you change MRS upward, e.g. 15 to 20, then the additional rooms will be automatically picked up per the method in #3 above.
6. Similarly, changing the license count upward will now take effect as in #3 above, i.e. relatively immediately. Changing the count downward will not take effect until Rebalance. (This is an uncommon case.) If the license expires or is removed, rooms will be shed automatically within a few minutes of the change.
7. Changing a license requires stopping one of the servers to apply the new license. During this time, other servers may pick up that server's rooms. Upon restart, that server will possibly get a few rooms or no rooms if the others have taken up the slack, and a Rebalance will be necessary.
8. Due to the rounding issues mentioned above and to be sure no rooms wind up never being loaded when servers and rooms do not divide evenly, it is possible for a server to pick up one extra room over the total license count. E.g., a customer with 3 servers and a 1000 room license may actually load 1003 rooms.
9. License expiration provides a "grace day" so, for example, if the license expires on 3/16/2018, the server does not actually drop the rooms until 3/17/2018. Once the Fusion server local time says 3/17, the 3/16 license is enforced.

Fusion API

For monitoring the server/services, the API now includes a monitoring resource where status on the services/processes/etc can be retrieved.

List of Members:

System Information -Hostname -OS Name (systeminfo cmd) -OS Version -System Boot Time -Total Physical Memory -Available Physical Memory -Virtual Memory Avail/In Use -Processor -File Space Spec/Usage -Network Activity -Timezone Services Status (Running, Stopped, etc..) -IIS -AD LDS -Crestron Fusion Service Manager Application Pools -Default Website -APIService -GroupwareService -OutlookWebService -WebClient	Fusion -Connections -Room Count -Loader Service/CPU%/Threads/Handles/Paged/Start Time/etc... -Data Service -Viridian Service -Signal Service -Schedule Service -Log Service -Media Service -Database Name -Database Server -SQL Auth Mode -SQL Credential -Service Account -Licensed State - RV/EM SQL -DB Size -Last Backup

Bug Fixes

Web Client:

Note: All users should clear the browser cache after upgrading to 11.1.6000.0092

- Fixed an issue where Fusion symbol discover fails when SSL authentication is enabled on the processor
- Fixed many layout and alignment issues in the Setup web client
- Fixed an issue where rooms were still visible in the tree after they were deleted
- Refined some error messages in the setup client
- Fixed an issue where an ampersand & in the eControl URL was not being rendered

Reporting:

- Fixed various issues with reports including:
  - Labels
  - Formatting,
  - Punctuation
  - Saving filters
  - Saving reports
  - Exporting
- Note: The Meeting No Shows report cannot be exported as CSV

Room Booking Wizard/Outlook Add-in:

- Fixed an issue where rooms with O365 calendars were not being returned
- Fixed an issue where available rooms were missing from the search results
- Fixed an issue where unavailable rooms were included with the search results

Scheduling:

- Fixed an issue where Managed EWS rooms would not validate. The EwsUsePoxAD Default parameter was being set from False to True on a database upgrade. If you encounter this behavior, check the All Config parameter and set EwsUsePoxAD to False.
- Fixed an issue where meetings could not be created on a time slot where a meeting previously existed (152922)
- No Show behavior for Google calendar single meeting has been modified to:
  The meeting is shortened; a meeting deleted email is sent if configured in Fusion
- Fixed several Google calendar issues related to No Show and Organizer behaviors
- Fixed several IBM Notes/Domino issues related to No Show and Organizer behaviors
- Fixed several R25 issues, including an issue where after editing a recurring meeting, it would disappear

Known Issues

Installer

- One or all of these Microsoft Security Updates (“KB4338424” “KB4338815” “KB4338419”) prevents the installation of Crestron Fusion installing on Azure VMs. This behavior was not observed on any on-premises server.

Microsoft provided a new Security patch KB4338831 that on July 18, 2018
Download it from the below link – this fixes the problem with KB4338815 on Windows 2012 R2 on Azure installations

https://www.catalog.update.microsoft.com/Search.aspx?q=KB4338831

If it does not install then use these instructions:
https://blogs.technet.microsoft.com/askcore/2011/02/15/how-to-use-dism-to-install-a-hotfix-from-within-windows/

REPORTING LIMITATIONS

Room name column is longer than the other columns in the Meeting No Shows report when the room name is long.

- Customer Impact: In the meeting for no show report if there is a long name for the room then the user will see the Room name column look longer than the other columns
- Workaround: Shorten the room name when adding to Setup.

Issues with some reports in Hebrew language.

- Customer Impact: In some reports using the Hebrew language, the user would see that there would be a colon before the room name when there is no data in the report.
- Workaround: Use English language for reports.

Some fields in various reports are not translated to the correct language.

- Customer Impact: In some reports, the user would see using the Hebrew language that some of the column names still display in English.
- Workaround: Use English language for reports.

Reports & Analytics: 'Energy Peaks by Room Title' generated report is not in readable.

- Customer Impact: Customer will not able to get required details in a readable format from generated report while selecting report type as '**Energy Peaks by Room Title**'
- Workaround: Export the report to Excel, HTML formats

Reports & Analytics: Date range is missing/not aligned properly in generated report summary.

- Customer Impact: Customer will not see the date range on the Energy By Asset Type, and Energy By Room Report summary page when there is no data.

The fields in various report summaries are not translated to the correct language.

- Customer Impact: In some reports, the user would see using the Spanish language that some of the column names still display in English.
- Workaround: Use English language for reports.

Missing color code to an Organizer in the Top Meeting Organizers report.

- Customer Impact: Customer will see in the Top Meeting Organizer report only one organizer has a color code under Summary while other organizers do not have any color codes.

Display Usage Current report shows the room names not very clearly if there are many rooms

- Customer Impact: Customer will not clearly see the names of the rooms on the X axis of the Display usage Current report if there are many rooms
- Workaround: Use the Y-axis to display the room names.

Online status History report shows time offline field value as :00

- Customer Impact: Customer intermittently will see on the Online Status report when selecting a language other than English some values in a field are shown as :00 instead of 0:00
- Workaround: Using English language will show the time correctly.

Top Organizer report name in Spanish appears over date range

- Customer Impact: Customer will see in the Top Meeting Organizer report, in Spanish language, the report name appears over the date range.
- Workaround: Using English language will show the report title correctly.

Energy Reports for date ranges like Yesterday, Today and Week to Date are not consistent when there is no data

- Customer Impact: Customer will that for some of the Energy reports with no data and different date ranges the report summary show different results. It should show NO DATA in the report in all cases.
- Workaround: The date range shows correctly, when there is data in the reports.

The Display Usage by Device report summary show the Date Range 01/01/0001 to 31/12/9999 on the summary when there is no data

- Customer Impact: Customer will that in the Display Usage by Device report the summary will show the Date Range 01/01/0001 to 31/12/9999 when there is no data.
- Workaround: The date range shows correctly, when there is data in the reports.

SCHEDULING LIMITATIONS

The daily recurrence meeting for a Room with Domino calendar will show 2 roles using newly created user

- Customer Impact: If customer will login with another administrator user and create a daily recurrence meeting on a room with domino calendar then 2 roles are showing under People tab.
- Workaround: User can login with the same account as the Domino account and create meetings.

Schedule Meeting using the MS Exchange 2016 calendar is not visible in 'Month View' after editing meeting in 'Week View‘

- Customer Impact: If customer makes changes in scheduled meetings in 'Week View', changes will not reflect in 'Month View'
- Frequency: Intermittent: 5 out of 10 times.
- Recovery: Changes will reflect after 5 minutes after browser refresh.

'Save & Close' button in the Edit meeting window is not disappearing after clicking on it.

- Customer Impact: Sometimes, when user will click on 'Save & Close' button for a schedule meeting; 'Save & Close' button will not close.
- Recovery: Refresh the Browser

Meeting subject intermittently does not appear to update on a Room that uses R25 scheduling calendar.

- Recovery: Refresh the Browser

Meeting subject intermittently does not appear to update on a Room that uses Domino scheduling calendar

- Customer Impact: Customer will not be able to change recurrence meeting subject
- Recovery: Refresh the Browser

User cannot perform more than one edit on the General Tab of Edit meeting for Google meetings

- Customer Impact: Customer will not be able to edit fields from General Tab after first time.
- Workaround: Perform all the edits on the General Tab the first time.

Recurring meeting is showing on current day's schedule after a Meeting Removed no show event

- Customer Impact: The user will see the future instance of a recurring meeting using Google calendar even after 3 strikes when the meetings series is supposed to be removed.
- Workaround: Remove the rest of the series manually from the schedule.

GENERAL LIMITATIONS

Edit contact and Delete Contact window intermittently does not open after adding a contact to Add Person to Role in Add Meeting

- Customer Impact: Customer will sometimes have problem opening Edit and Delete contact window after adding a contact.
- Recovery: Refresh the Browser and select the checkbox for Edit and Delete and the window will open.

Google Mailbox is not verifying in Add Room Window but will show success message in Edit room window

- Customer Impact: If the user wants to add a room with a Google calendar address and tries to verify the mailbox settings an error message will be shown
- Workaround: The user can save the settings for the Google calendar and then try to verify the Mailbox setting from the Edit Room window.

Forwarding and Alert Service under Configuration need translation.

- Customer Impact: If the user selects any language other than English he/she would see the Configuration WC fields such as Forwarding and Alert service not translated correctly.
- Workaround: Use English Language for those fields.

Version 11.1.5000.0020

Version 11.1 R5 (release 5) is the fifth in a series of 11.1 releases. This release is a maintenance release.

Changes since Last Version

New Features

Starting with 11.1.5000, a new install of Crestron Fusion no longer supports any connection without a license. The software requires a license to make any room connection.

Bug fixes

- Modified several reports to show proper message when no data is found
- Modified alignments on several reports
- Modified punctuation on several reports
- Fixed filtering on several reports
- Fixed an issue where IBM Notes operations did not clear the meeting free/busy data
- Improved the default No Show warning message
- Modified the web interface for monitoring and setup for more consistent behavior when displaying objects
- Fixed several problems with object permission behavior between setup and monitoring
- New analog attributes are now added without the default graphic gauge
- Fusion needs to reflect changes in the organizer made from the scheduling provider
- Fixed rebalance button behavior
- Confirmation window added when closing tabs

Known Issues

There are no known issues.

Version 11.1.4000.0028

Version 11.1 R4 (release 4) is the fourth in a series of 11.1 releases. The primary focus of this release is improved booking times, especially across multiple scheduling devices in a room. In addition, the scheduling behaviors for Decline for No Show, End Meeting, and Extend Meeting applications across all supported scheduling providers are improved.

Decline for No Show Logic

There are three variants to the Decline for No Show (D4NS) application behavior, described below.

EWS, EWS Managed, Domino Providers

Requires Smart Graphics OOTB and EWS, EWS Managed, or Domino providers:

Single meeting	The meeting is shortened to the time when D4NS was fired; a meeting changed email is sent if configured in Fusion.
Recurring, Strike 1	The instance is shortened.
Recurring, Strike 2	The instance is shortened; a warning email is sent if configured in Fusion.
Recurring, Strike 3 w/ Limited Recurrence	The instance is shortened, and all future instances are removed; a meeting deleted email is sent if configured in Fusion.
Recurring, Strike 3 w/ Endless Recurrence	Depending on the setting of ExchangeDeleteEndlessRecurrence: • True: the meeting is removed, including past and future instances; a warning email is sent if configured in Fusion. • False: the meeting is left intact; subsequent strikes will be treated as Strike 3.

Internal Provider

The behavior of the Internal "RoomView" provider is slightly different:

Single meeting	The meeting is shortened to the time when D4NS was fired; a meeting changed email is sent if configured in Fusion.
Recurring, Strike 1	The instance is left intact.
Recurring, Strike 2	The instance is left intact; a warning email is sent if configured in Fusion.
Recurring, Strike 3 w/ Limited or Endless Recurrence	The instance is left intact, but all future instances are removed; a meeting deleted email is sent if configured in Fusion.

Google, R25, External Providers

All other OOTB and provider combinations:

Single meeting*	The meeting is deleted*; a meeting deleted email is sent if configured in Fusion.
Recurring, Strike 1	The meeting is left intact.
Recurring, Strike 2	The meeting is left intact; a warning email is sent if configured in Fusion.
Recurring, Strike 3	All instances of the meeting are removing, past, current, and future; a meeting deleted email is sent if configured in Fusion.

*Google single meetings are truncated

End Meeting Early and Extend Meeting Logic

End Meeting Early (EME) and Extend Meeting (XM) applications are essentially the same operation: a change to the meeting end time, either forward (XM) or backward (EME). Extend Meeting is only available on devices running Smart Graphics version of the scheduling application, whereas Extend Meeting Early is available on older scheduling panels like the TPMC-4SM or TPMC-3SM. Furthermore, XM/EME is only operational for recurring meetings when the provider supports instance manipulation. Currently, these are EWS, EWS Managed, and Domino.

Enhancements:

- Immediate Scheduling – All displays and scheduling devices that are push registered will be updated simultaneously within several seconds from the first updated display to the last updated display
- Added relative date range option to scheduled reports
- In the web client, pressing the enter key will activate the save button in many dialogues
- Added a new API resource named “Alerts” that can retrieve a list of critical status notifications

Security:

- Addressed several issues flagged by VeraCode scan
- Improvements to the Functional Security setup pages
    - Check boxes added
    - Users can no longer remove the super user account from Functional Security policies
- Fixed an issue where the Instant Messages are still visible when a user does not have permission
- Fixed issues with Fusion EM Automation functional security policy
- A link was added for users to return to the login screen after failed login attempts

Bug Fixes:

Domino/IBM Notes:

- Fixed meeting operation behavior for Domino meetings with multiple rooms where the wrong room calendar was getting modified (132906)
- Fixed an issue where Decline for No Show was getting triggered on Ad Hoc Domino meetings (142405)
- Fixed an issue where Domino meetings created in Fusion could not be updated using the Fusion web client (141491)

- Fixed an issue where the Organizer email was missing from Action or Preset meetings created using the Outlook Add-in (136148)
- Added error handling to the External Provider to prevent calendars from being mistakenly cleared on scheduling panels (139709)
- Fixed language translation for the Assets Online report
- Added the ability in the People search to search by email and username

Version 11.1.3000.0025

Version 11.1 R3 (release 3) is the third in a series of 11.1 releases. One new feature is in this release – redesigned scheduled report behavior.

Enhancements:

- Improvements for scheduled reports
    - Manage schedules completely from Fusion web client
    - More scheduling options
    - Specify recurrence start date for scheduled reports
    - Scheduled reports run at server’s local date and time instead of UTC
- Improvements to Functional Security
    - Only show groups in the web client that pertain to the current mode of Fusion, either Forms or Windows Integrated.
    - Show the Windows groups the user is a member of in Setup > People
    - In Setup > Security Groups, show the members with name and email address for any user that has logged on at least once
    - Added ability to delete groups even if the group has members

- New Report – **Meeting No Shows** – this report provides an analysis of No Show events including time lost and recovered time.
- Added a search field to Setup > People to search users by username or email address

Bug Fixes:

- Occupancy Data
    - Fixed an issue where scheduling panels generate false occupancy log entries (137526)
    - Fixed an issue where sharing occupancy status across devices in a room would produce multiple occupancy log entries in the attribute log (116816)
- Fixed an issue where some service logs were not limited by the "Logs to Keep" setting
    - Outlook Web Service is an exception and will always retain up to 50 logs
- Adjusted email template formatting
- Adjusted report formatting for some reports
- Fixed a condition where the attribute "Room Occupancy Information" was missing from the asset status tab
- Fixed behavior where some programmed assets always show offline in Fusion (137533).
- Search prompt added to the "Current Values" report attribute drop-down
- Adjusted the default EWS related "All" configuration values (136568)
- Added minor interface modifications on some screens of the web client
- Fixed an issue where devices discovered using symbol discover with outbound connections are not setting the connection direction (137602)
- Fixed an issue where the Fusion EM web client continuously prompts for credentials (136914)
- Fixed a condition where a daily scheduled report was being sent twice (137084)
- Fixed an issue where the Fusion installation fails with SQL server using Hungarian CI AS collation
- Fixed the mechanism to tag Fusion servers as "transcode only" by using the EnableMedia check box

Version 11.1.2000.0023

Version 11.1 R2 (release 2) is the second in a series of 11.1 releases, primarily merging previous patches, addressing issues, and introducing 1 new feature.

Enhancements:

- Added an option to specify a custom SMTP port for notifications
- Added the ability to remove previously configured Active Directory groups
- Include "Partially Online" rooms in the My RoomView – Offline Rooms list
- Increased the limit of attribute email rules from 25 to 50
- Modified the Monitoring web client so that xpanels only load when the eControl tab is selected.
- Brought forward Micros support enhancements from 10.2
- Added row shading to Object Security for legibility
- Improved PinPoint performance.
- Added Installer support for Microsoft Windows Server 2016
- Added password complexity for Forms – see Security below

Reports:

- New- **Online Status History**
- New- **Data Values** – similar to the Data Values (analog | digital | serial) but allows for mixed types on the same report
- New- **Device Usage by Meeting**

- New- **Device Usage Totals** – provides a high level executive summary showing scheduled meetings, device usage, and occupancy
- New- **Meeting No Show** report – time saved and time lost from No Show cancellations
- Data Values * - all reports can now include reserved attributes
- Modified Display Usage (current) to indicate “Offline” rooms
- Fixed a German Language date range issue (135271)

Security:

- Added password complexity rules to Forms based installations. Passwords require a special character, a digit, and 8-32 characters
- Implemented secure cookies (brought forward from 10.3 - 132592)
- Fixed an issue where the a user session is not terminated when the user logs out (121777)
- Fixed an issue where access control for meetings could be circumvented (132585)
- Fixed an issue where improper scripting characters could be entered and transmitted in the Instant Messaging tab (132584)

Data Logging:

- Added a validation method to help prevent the logging of duplicate device usage including occupancy sessions (116198)
- Fixed an issue causing occupancy sessions greater than 1 billion minutes to be logged (125637)

Fusion API:

- Fixed an issue where positive UTC offsets were not accepted
- Fixed an issue where appointments were not returned in JSON
- Added support for extended characters coming into Fusion through the external provider
- Fixed an issue where the RV Meeting ID was not being returned after a room change
- Minor changes to properties and documentation

Bug Fixes:

- Fixed improper attribute forwarding time out condition
- Corrected an issue with inbound and outbound discovery of programmed asset records not receiving the correct values (119091)
- Decline for No Show (D4NS) now correctly trims single meetings instead of removing
- Fixed an issue where meeting messages were not being sent to organizers outside of Fusion
- StartDate and EndDate variables in Email Templates now properly adjust for time zone

Web Client Monitoring

- Fixed an issue where monitoring tabs closed for one user are closed for all other users
- Fixed the Error Alert sort in the Rooms tab
- Fixed an issue where an R25 weekly recurrence is shown incorrectly

Web Client Setup

- Prevent the manual deletion of the default Active Directory administrators group defined in the configuration manager
- Fixed the reversed Object Security settings for eControl and WebCam
- Fixed the ability to scroll to Un-associated objects when tree expansion pushed the node off-screen
- Fixed the paging on the Attributes search results pages
- Fixed an issue where security groups could not be deleted if they ever contained members

- Fixed an issue when editing multiple rooms for managed EWS scheduling where the domain was not saved

Web Client EM
- Fixed the an issue where deleting events was not being sent down to the processor
- Fixed an issue where the Event Calendar Time Clock would jump to the current date
- Fixed a translation with Chinese/Korean languages on the Event Calendar

Known Issues:
- DBIC (Database Integrity Checker) – does not work with all combinations of Windows Server and SQL. Combinations that do not work include:
    - Windows Server 2012 with SQL Server 2014

Version 11.1.1000.0037

Version 11.1 R1 (release 1) is the first in a series of releases introducing new features. 11.1 R1 does not include recent patches and reports – these will be included in the upcoming R2 release.

The new features available in 11.1 R1 are the following:

- Security - Audit Trail
- User Interface Updates
    - Assets and Rooms tab UI
    - Bulk operations
- Support for multiple Google calendar accounts

Features:

1. Audit Trail

- Enable or disable the audit trail feature on the Configuration web client.
- The ability to enable or disable the audit feature is restricted to those users with rights to the configuration view.
- The default state for auditing is “enabled”.
- Audit information is stored in the Microsoft Windows event log and includes the following data:
    - User ID
    - Date and time of the event
    - Type of event
    - Origin of request (e.g., originating host’s IP address) for Identification and Authentication events only
    - Name of data object modified or deleted for deletion or modification events only

Auditable Categories:

Auditable Event	Category	Description

User Authentication	Authentication	Audit login, logout events, along with security groups the user belongs.
User Security Changes		User Creation, group membership changes.
Room Security Changes		Changes to what groups can view a room.
Error Alert Cleared	Error Alerts	Audit when a user clears an error alert for a room, log the cleared alert (severity and message).
Device Connections		Audit when a device attempts to connect to Fusion and whether the connection is successful or not
Destructive edits		Audit when a room or node is deleted
Manual actions		Audit when a manual action (such as a broadcast message) is sent from Fusion, including who activated it, what was activated, and which rooms/nodes it was sent to

Note: Audit Trail for logins – When Fusion is active directory integrated logins will not appear in the audit trail as Windows logins are handled by the operating system outside of Fusion.

2. Bulk Operations

In all UI screens where multiple selections can be made by selecting check boxes (bulk assignment):

- Users can select one selection, then Shift + Click a different selection, and all options between them will be selected
- When options are selected and the user selects somewhere other than a checkbox, the previous selections will remain checked instead of becoming unchecked

3. Assets and Rooms Tabs

The Assets tab supports the configuration of attribute views like the Rooms tab.

- The user can rearrange the attribute columns of the Rooms and Assets tabs using drag and drop.
- The user can adjust the size of attribute columns.

4. Multiple Google Accounts

Fusion now supports multiple Google calendar accounts on a single instance. Contact FSG at fsg@crestron.com for assistance with configuring this feature.

Enhancements:

- Added drivers for the following network connected devices:
  - TSW-560V3
  - TSW-760V3
  - TSW-1060V3
  - TSW-552V3.xml
  - TSW-1052V3.xml

- TS-1542-CV3
- TS-1542V3
- Crestron_RL_300
- DGE-100V3.xml

- Reports- Added a new report "**Data Values (Current)**" – compare the current values of several user selected attributes on one report
- Added SQL SP enhancements for improved scheduling performance
- Removed a limitation on the number of EWS notification listeners to additionally improve scheduling performance in some cases

Bug Fixes:

- Fixed an issue where non alpha-numeric characters were removed with editing multiple rooms for scheduling

Version 11.0.5.15

Version 11.0.5.15 is a maintenance release that addresses several web interface issues and improves stability.

Version 11.0.4.42

1. Fusion 11.0.4 RV and EM licenses now contain room counts which are enforced. Upgrading previous versions of fusion to 11.0.4 will cause RV and EM unlimited licenses to be converted to valid 5 room licenses with an expiry of 12/31/9999. Customers will need new license keys for RV and EM after upgrading to 11.0.4 from any earlier release version.

2. After performing inbound discovery of a device, it will be placed in the "Discovered Objects" node. It will also be placed in the "Group will not be loaded" server group. Moving the room into another node will not bring the room online. The user must move the room into another group such as the "Default Group", or another active group.

3. Inbound discovery (Device-to-Fusion registration) can be performed by an on-premises Crestron Fusion Cloud server. The only restriction on discovery is that one cannot have an outbound (Fusion-to-Device) connection with a hosted Crestron Fusion server in the cloud.

4. SSL v3 will no longer be supported in Fusion 11.0.4. This is in line with industry practice which has deprecated SSL v3 because it is highly vulnerable to man-in-the-middle attacks via the POODLE vulnerability. It has been disabled entirely in all major browsers.

   Crestron Fusion Cloud 11.0.4 and later supports TLS 1.0, 1.1, and 1.2.

   This means that starting with 11.0.4, 2-Series processors will no longer be able to connect to Fusion with SSL on.

Any 2-Series control system will continue to be able to connect to Fusion with SSL turned off.

Enhancements:

- Added a new method for handling incoming newly registered devices. Inbound devices (Device-to-Fusion) are added to the “Discovered Objects” folder; discovered rooms are initially added to “Group that will not be loaded” to prevent Fusion from connecting automatically
- Added support for Check-in to/from an external provider (110280)
- Reports - Added a filter to the Rooms Online report to enable filtering by online/offline/partial online states
- Reports - Added a report for online status for Assets
- Reports – Added a feature to show or hide deleted meetings from the room utilization and meetings by room reports. (Deleted meetings are denoted by a (X) in meeting subject)
- Reports – added the ability to identify meetings created using PinPoint
- Reports- Added a new report “Booking and Occupancy”
- API – added support for retrieving data from Custom Fields when using asset queries
- API – added support retrieving attribute values from a programmed Asset definition
- Backfill -Changed the behavior of backfill so that when backfill threads are set to zero the system will stop created backfill jobs.
- Backfill – changed the default values for Backfill – Populate Backfill Interval = 90 and Number of Backfill Threads = 0
- Licensing - Added support for limiting room loading based on licensing counts
- Licensing – Added support for using expiration dates for both RV and EM licenses
- Added support for SSH and username/password authentication for outbound (Fusion-to-Device) symbol discovery
- Added support for the CEN-AVF-HUB
- Added support for DM-DGE-200-C. A new driver was added for this to Touch panel asset type.

Bug Fixes:

Web Client

- Fixed an issue where ampersand characters “&” are removed from an e-Control URL and webcam URL
- Fixed an issue where ampersand characters “&” are removed from password fields for scheduling providers
- Fixed an issue where the room or asset grid is empty upon first logging into Fusion
- Fixed a few instances of inaccurate paging on results
- Fixed an intermittent issue where the time zone default on a new meeting was not being set
- Fixed several issues regarding missing buttons on certain dialogues
- Fixed an issue where European formatted dates are displayed with the US format
- Fixed an issue where the link field was not saved when saving actions

Scheduling:

- Fixed an issue with Managed EWS where the requested body of a meeting was not returned
- Fixed an issue when using the Managed EWS provider where the organizer’s email address appears as “no_one@nowhere.org.
- Google service provider is now FIPS compliant

- Fixed an issue where Google calendars would deny access after an hour
- Fixed an issue where EWS Managed AD does not handle bad SMTP redirects and causes an infinite loop in the schedule service
- Fixed an issue with the schedule availability check that could result in a double booking
- R25 – fixed an issue regarding weekly recurrence showing incorrectly
- R25 – fixed an issue with room templates using R25 where the verify button was missing
- Fixed support for TLS 1.2, deprecated support for SSL v3

Reports:

- Fixed an issue on the display usage report where only the first page of a multi-page report is displayed.
- Minor fixes to various reports

Version 11.0.2.84

Enhancements:

- Security - Added protection against Cross-site Request Forgery (CSRF) attacks
- Security - Added provisions to further secure passwords and other data in the browser
- Added support for R25 “Blackout”, “Setup”, and “Takedown” bookings
- Added new TPMC-4SM driver (model v2.2.0+ OOTB, driverID TPMC_4SM_V3) to support room occupancy info
- Crestron Fusion database modifications added to make Crestron Fusion collation independent
- PinPoint - added support for federated environments in PinPoint deployments where the directory service is on-premises
- PinPoint - added two switches to the All Config parameters
    - CEMASuppressNonReservableRooms – if set to TRUE, the search for rooms will only return EWS, EWS Managed, Google, and Non-Bookable rooms. All other rooms will be excluded from the search
    - CEMASuppressOccupancyFilter – if set to TRUE, rooms that are currently occupied will be included in the search

Bug Fixes:

- Fixed an issue where a scheduling panel in push mode does not reflect a deleted appointment
- Fixed an issue where Crestron Fusion does not properly indicate an SSL connection.
- Fixed an issue where touchpanels and other devices are not able to maintain a connection to a Crestron Fusion Cloud server
- Fixed an issue where duplicate backfill jobs are created in a multiple server environment
- Reports – fixed various formatting issues
- Fixed the link to the Insite help page
- Fixed an issue where the rooms grid would not populate when first logging in to the web client
- Addressed several web client interface anomalies

Version 11.0.1.60

New Features:

- **Crestron Fusion® Cloud:** initial release and rebranding

Configuration Manager

- “Use Specified Account” is now the default option on the first page of the installer for setting service credentials. If Local System is selected, only SQL authentication will be allowed for the database connection
- “Test Connection” button now tests both Administrator and runtime credentials
- “Verbose” option added to show all messages from FSM
- Installer progress bar now shows percent complete relative to the total number of database update steps

Web Client

- General: UI updated with more contemporary theme, improved responsiveness – clear the browser cache if you have upgraded from a previous Fusion release
- General: Crestron Connected driver for Display asset added to device drivers
- General: reduced the number of Alert emails sent and eliminated alerts on program attributes when the symbol goes offline
- Monitoring: 1MB limit on document upload has been extended to 50MB
- Monitoring: Uploaded document file types exclusions are now limited to BAT, EXE, COM, JS; files allowed for upload/download have been extended, supported types now include: TXT, DOC, DOCX, XLS, XLSX, HTML, PDF, ZIP, MP3, MP4, BMP, JPG
- Monitoring: web client remembers last tab selected from a previous session, tabs can be reordered by drag-drop or closed; a user can configure/reconfigure which tabs are displayed via their Profile
- Monitoring My RoomView tab: UI improved with collapsible sections, added Offline Rooms category; clicking on a critical alert opens the Room Details; clicking on a the help request or critical alert icon in the navigation/Header Tab jumps to My RoomView tab
- Setup: email template has been enhanced to show the asset name in the email; use the dropdown to insert asset name

Bug Fixes:

- Fixed: in the Configuration Manager, the database server port number will now populate when another instance of the application is loaded
- Fixed: during Apply in the Configuration Manager, the Fusion Services Manager (FSM) error “user isn’t of sys admin type” will no longer occur if the database installer identity was correctly specified with this privilege
- Fixed: the installation process will successfully complete when installed on an IIS Web Site other than Default
- Fixed: in Google Calendar, support added for time zone name change from “America/Buenos_Aries” to “America/Argentina/Buenos_Aires”
- Fixed: end early button now works on meetings in Google Calendar
- Fixed: user name no longer substituted with Default Organizer on room scheduling panels connected to a Google Calendar resource
- Fixed: on a room with an EWS:Managed schedule, if it was configured with a bad resource address or an Exchange server issue is preventing the calendar from being retrieved, schedule requests from the Monitoring client will now display an error and scheduling panels will no longer fail silently with an empty schedule and will generate a critical alert
- Fixed: Impersonation with an EWS:Managed provider is now being performed when EwsUseImpersonation set to True
- Fixed: Online Status entry for Assets with a Connection Type of None will now be displayed as blank

- Fixed: for Inbound connections, a false Partial Online is no longer recorded on a room having two or more Assets that are reporting Online
- Fixed: Crestron PinPoint room can now be determined when a meeting is created in Apple iOS or OS/X, or under other circumstances where the user has no permission to view the room calendar
- Fixed: Deleting an Asset driver when the driver is in use by another asset is no longer allowed
- Fixed: if you edit a room and change its server group to "Group will not be loaded" any devices in the room will now be disconnected
- Fixed: a processor re-discovered via the Symbol Discovery process, the room will no longer move out of its existing node in the tree to the context of discovery. Similarly for inbound device discovery, the room no longer moves to the Root Node.
- Fixed: the filename no longer disappears the first time the user presses Upload when adding a document in the Monitoring web client

Upgrade/Configuration Notes:

- When using the Microsoft Exchange EWS (non-Managed) provider:
    - The version of Exchange server should be specified in the All Configuration setting EwsDefaultVersion e.g. as Exchange2010_SP2.
    - The Microsoft Exchange EWS (non-Managed) provider is no longer supported with Microsoft Office 365. Migrate existing rooms on an upgraded server to Microsoft Exchange EWS: Managed.
    - The All Config property EWSUseOldAD is no longer supported.
- When using the Microsoft Exchange EWS: Managed provider with Microsoft Office 365:
    - Autodiscovery is required and the server endpoint is not configurable – Crestron Fusion uses Microsoft standard autodiscovery. Use the Microsoft Remote Connectivity Analyzer https://testconnectivity.microsoft.com/ and select Outlook Autodiscover to inspect timeouts and delays in the discovery infrastructure in order to optimize performance
    - There is no service account in Cloud Edition installations. As such, each room must be configured with the UPN identity of a user ID that can manipulate the resource calendar. Your Exchange Administrator has the necessary PowerShell scripts and access to configure Impersonation for the above identity.
    - Crestron Fusion must be configured for Impersonation; the All Config variable EwsUseImpersonation must be added (bit) and set to True.
- When using the Microsoft Exchange EWS: Managed provider with Microsoft Exchange Server
    - If using more than 20 rooms, it is recommended to configure Exchange for Impersonation. The service account that can manipulate the resource calendars must be configured for the rooms. Your Exchange Administrator has the necessary PowerShell scripts and access to configure Impersonation for the above identity.
    - Crestron Fusion must be configured for Impersonation; the All Config variable EwsUseImpersonation must be added (bit) and set to True.
- When installing Crestron Fusion on-premises and using the Crestron PinPoint app from the public App Store, the All Configuration setting CEMAAllowedAppsOnPrem should be set to AppStore or AppStore|Enterprise

IV. Known Issues

Installation

- Installer is not detecting that the binaries supporting the installation of roles that are not present on the server are removed. If the customer reduced the footprint of their server image, the install will fail silently and leave Fusion in an inoperable state.
- Two installers may not be actively running against the same database at the same time.
- The Fusion 10 installer will create a separate “Crestron->Fusion” program group on the Start menu separate from other Crestron installed software.
- After completing install, if an HTTP 500 error is observed when browsing to the web interface, run the following command with Administrator privileges: C:\Windows\Microsoft.NET\Framework64\v4.0.30319\aspnet_regiis.exe –i
- During a fresh installation, the Allconfig setting "FloorplanDebugMode" is set to TRUE by default whereas it should be FALSE.
- In a new installation, the application instance must have been started and stopped once before any license can be applied.
- In a multi-server environment, the anonymous access required by MSMQ may not get applied correctly to the second server. Pressing the APPLY button in the configuration manager again will set the permission correctly.

Configuration

- The SQL Disks feature will not reset file locations to their default values if the user creates a new database.
- The configuration manager may throw an exception instead of alerting the user when there is another user session of the configuration manager currently running.
- Configuration Manager - Welcome Page / Fusion Services Window – the Router Service name appears as "CRVRouterService" instead of the friendly name “Router Service”
- Runtime Credentials authentication type radio button is unselected after APPLY and returning to the database configuration screen.
- After Apply, database update messages may exceed 100% complete.

Database

- The database name cannot include a hyphen character ("-").
- The database connection must be specified with a fully qualified domain name, an IP address cannot be used.
- An existing 9.3 or earlier database cannot be upgraded while replication is enabled. Replication is enabled for installs that include a separate log and reporting database. This configuration is no longer supported. Installs that only include a separate log database do not involve replication. Disable replication before proceeding with the upgrade. See Section II above regarding software upgrades.

Administration

- Setting Connection Direction to None for an Outbound asset does not disconnect/prevent the asset from being started. Workaround: set Connection Type to None.
- In Setup, when moving a room from one node to another node that are flagged as different buildings for Crestron PinPoint, the warning “Beacons associated with this room will be deleted” is generated even if there are no beacons defined on the room.
- Configuring security on the processor is not compatible with autodiscovery in all circumstances. Workaround: enable security after discovery.
- Impersonation support via the EWS:Managed provider requires the All Config variable **EwsUseImpersonation** must be added (bit) and set to True.
- The driver update function will not update the Model if changed in the new driver.
- Nodes are not listed in the server groupings and the number of rooms per server doesn't match the group number.
- The server group tree will not automatically update when a new server is added.
- Configuration - Server Uptime always shows at least 8 hours even after server restart.
- Empty security group cannot be deleted if it previously contained a deleted person.
- Fusion API: the server will ignore API_Room.Persons on Room PUT
- In Configuration web client, the pagination controls on server rooms list may become disabled

Monitoring & Asset Management

- When Connection Type on an Asset is changed from having a connection to none, the status in the Monitoring UI is shown as offline
- Rooms and Assets in Group will not be loaded may show as Online in Monitoring if that was their prior state before the Server Group was changed
- When logged out, Fusion returns a blank screen from a bookmarked URL with a particular WC page (eg. setup or monitoring) and does not log the user into the requested page
- In FireFox, when there are no active alerts the user is improperly navigated to My RoomView tab upon starting the Monitoring web client.
- Selecting a currency other than USD in Setup still shows the “$” sign when the historical energy chart is displaying cost.
- Special characters (<>) are removed from input fields in the user interface.
- Attribute values related to broadcast message not appearing correctly in the Monitoring web client: in the status tab of the asset, broadcast message enabled will show a red x and broadcast message type will show a shaded color bar
- The Reset button in the Capture tab may show as “undefined” when it is the default tab.

Capture

- The approval link from the capture email notification will not allow unauthenticated users. The user must log into Fusion in order to approve capture content for distribution.

Room Automation

- Energy management: Time clock control does not support dd-mm-yyyy format.
- Energy management: For accurate calculation of sunrise/sunset, you must have the Time Zone and Geographic Coordinates defined at the node/room

Scheduling

- In Google Calendar provider, if you edit time, date or meeting name on a multi-room meeting in the Monitoring web client, only the first room - the one used to book the meeting - shows the updated info
- For recurring meetings on the RoomView internal calendar, multiple 'check-in failed' emails may be generated if the Check-In function is enabled on a scheduling panel.
- Meetings that have actions associated should be booked 30 minutes in advance of the meeting start time.
- A panel that supports push must be configured for polling mode when combined with another panel/device that only supports poll in the same room.
- A recurring meeting with no end date made in Lotus Domino does not show all the future instances in the web interface.
- Recurring meetings created from the Crestron Fusion® web client must be deleted and recreated in order to change parameters such as the date, time, or recurrence pattern of the meeting.
- The "Check Email" configuration option should be disabled for Lotus Notes installations.
- Editing a meeting in the Crestron Fusion® web client that was created from Lotus Notes will delete and re-create the meeting on the calendar. This may cause the meeting to momentarily disappear from the calendar.
- Fusion may not always detect a double-booked room when a meeting is added to a room's calendar through Microsoft Outlook and a second meeting is added for the same time to the same calendar through Fusion.
- A recurring appointment using Exchange EWS that is updated to extend the number of occurrences may display at an incorrect time after DST transitions when viewed from a Web Client in a time zone with different DST transition dates.
- A meeting scheduled by a Web Client user in a time zone that differs from that of the room or rooms in the meeting may not be correctly scheduled over a Daylight Savings transition if one time zone supports DST while the other does not.
- In order to retrieve older meeting data, a backfill job must be manually created with a start date that reflects the timeframe of meeting data to gather.
- A recurring meeting that includes multiple rooms where the rooms span multiple time zones may not reflect the correct time for instances of the meeting that occur after a daylight savings time change.
- Creating a recurring meeting in an area that doesn't participate in Daylight Savings can cause some occurrences of that meeting to display a start and end time one hour earlier than specified.

Reporting

- Scheduled reports will always run on weekends, even if not selected.
- The second page in the Display Usage by Device report is blank.
- Cannot print Device Usage report in FireFox under certain circumstances.
- Instant Messaging report when displayed, the inner frame scrollbar is not accessible, causing the displayed content to be cut off, and the content in the exported PDF file is not formatted correctly
- Permissions on tasks for scheduled reports must be set from the Windows task scheduler after the scheduled task is created.

Licensing

- The application instance must be run once <u>before</u> the application is licensed. Follow the steps below:

1. Complete the install without licensing
2. Run the instance
3. Stop the instance
4. License the application

- Entering a PinPoint license will cause the Monitoring and Energy Management licensed on dates to change to match the PinPoint license date.

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