SANDXXXX-XXXXX

GMS Release Notes

Version 1.27 (for GMS PI 27 Open-Source Release)

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Contents

Fixes

General

- Increased parallelization of channel segment requests for improved performance
- Vertical scrollbar no longer flashes on right-hand side of the UI when loading, until user preferences are loaded
- Fixed issue where alignment text wasn't updating properly when closing an event

Event List Display

- Fixed issue with column filtering, following issues addressed:
    - 'Unknown' string should be filterable & findable
    - 0.000 should be filterable & findable
    - Workflow Status Column entries are filterable
    - Sdobs column entries are filterable
    - Time column entries are filterable
    - Depth std deviation column entries are filterable
    - Coverage/Confidence semi-major/semi-minor columns are filterable

Map Display

- Fixed issue where Events, SDs, and stations cannot be de-selected within the Map Display by clicking on another entity (to select something different) or clicking on the same entity that is selected

Waveform Display

- After scrolling within the Waveform Display, when measurement window is open/adjusted, waveform rows are not clipped (i.e., cut off at top/bottom vertical position) & number of rows displayed matches the number channel integer spinner (does not include measurement window)
- Fixed issue where a number of waveform display hotkeys are inappropriately disabled outside of split mode
    - Current Phase menu toggle
    - ZAS hotkey
    - QC mask visibility
    - Create event beam config
    - Hide measure window
    - Toggle alignment
    - Increase/decrease number of waveform rows shown
    - Scale all waveforms to selected waveform
    - Toggle uncertainty
    - Reset all amplitude scaling
    - Reset manual amplitude scaling

- Fixed issue where users cannot cancel creation of new SD when clicking on expanded raw channels in split mode
- Fixed issue with SD time uncertainties not moving on retime with newly created SDs
- Fixed issue with y-axis scale flickering (re-rendering) when filtering in split mode
- Fixed issue with not being able to modify phases on newly created SDs
- Vertical scrolling performance improved by ~10X
- Fixed regression wherein stations & raw channels cannot be selected in the Waveform display.
    - Selecting stations in the Waveform Display selects the corresponding stations in the Map Display
- Fixed issue with waveforms disappearing when waveform display tab is under another tab
    - Waveforms do not disappear when Waveform Display tab is under another tab
    - Zoom does not change when clicking off Waveform Display tab and onto another tab

Workflow Display

- Fixed issue with workflow intervals disappearing when workflow display tab is under another tab or resized

Undo/Redo Display

- Resolved undefined row issue occurring after multiple associate/unassociate events
- Multiple entry row dims appropriately in the Undo/Redo Display based on whether entries in multiple stack have been undone/redone

Improvements to GMS

Event List Display

- The `Depth Std Dev` column title has been updated to include units (i.e., Depth Std Dev (km))
- Users can right-click to view event metadata details via the existing event details context menu option within the Event List Display
    - Users can use alt/option + click hotkey to automatically open the event details menu via the Event List Display

FK Display

General

- The Analyst can view a set of FK thumbnails in the Azimuth/Slowness Display, ordered by station ordering mode set in Waveform display and secondarily by arrival time of the associated signal detection (if more than one)

  - FK Spectrum image shows FK spectrum data around the arrival time of the SD and includes a Station-Phase label, a configurable set of constant-velocity rings, predicted azimuth/slowness marker (if available & event open), and is rendered using a configurable colormap (Turbo default)
  - Tooltip exists on hover over station-phase label, to provide helpful text if the text does not fix in the available space
  - Beside the station & phase label are controls to accept & hide the FK
  - The Azimuth/Slowness Display shows FK thumbnails for the Signal Detections associated to the currently open Event.
- The Analyst can select (and open) a single FK by either double-clicking an FK thumbnail, using options to move to the "next" FK, or by choosing the "Show FK" option on a Signal Detection context menu (in the Waveform, SD List, Map Display).
  - When analyst selects an FK thumbnail, the FK selection is outlined using a configurable FK selection color
  - When analyst selects to view a thumbnail that "needs review", its state changes to "doesn't need review" which updates its accept icon color (yellow) to the normal/default blueprint button color (gray)
  - The Analyst can view FK data for the selected FK in the FK Spectrum interface labeled with the Station Phase (ZALV P) of the selected FK
  - The Analyst can view an FK spectrum plot showing the FK spectrum image, a configurable set of constant-velocity reference rings (by station type), and markers for the predicted, peak, and measured azimuth/slowness values
- Analysts can add Signal Detections to the Azimuth/Slowness Display from the Waveform Display, Signal Detection List Display, or Map Display by using a "Show FK" menu option on the existing right-click Signal Detection context menu
  - Manually added FKs are added to the bottom of the FK previews & stay at the bottom when filtering options change (i.e., filter doesn't change order)
  - All manually added FKs are removed when changing/closing an event
- When a detection is deleted, the ‘Show FK’ option is disabled in all displays (Waveform, SD list, Map Displays)
  - ‘Show FK’ context menu option has been updated to state how many action targets are applicable based on selection (e.g., Show 5 FKs)
- If an Event is open for review and azimuth/slowness predictions are available for the Signal Detection phase, the predicted azimuth and slowness is shown as horizontal lines on the azimuth and slowness traces respectively
  - If no predicted value is available or an event is not open, the horizontal prediction lines aren't shown
- Analysts can click a point on the larger FK spectrum image to select a new azimuth/slowness measurement
  - The measured icon is adjusted to the analyst's clicked location within the FK spectrum image
  - As the analyst clicks to select a new azimuth/slowness, the measured column values are updated within the FK measurements table

    - Measured value are initially displayed in the FK thumbnails/FK larger spectrum image if one exists
    - The new measured value will be updated in the FK thumbnails when the analyst adjusts to select a new azimuth/slowness measurement once the FK has been accepted
- FK Display works with tearable tab functionality and is synchronized with other display interactions when in a separate tab:
    - Analysts can right-click the Azimuth-Slowness tab in GL and choose to open it in a separate tab
    - Analysts can right-click the icon next to the Azimuth Slowness context menu option in the ui-app -> Analysts Displays context menu option & choose to open it in a separate tab
- The 'Hide Selected' option within the FK thumbnails interface has been broken out into a button; all functionality remains the same (previously was an option under Approval subheading)
- Analysts can select single or multiple FK thumbnails and right-click to open the Signal Detection context menu and use the common Signal Detection options (e.g. to open details, change association, change phase, reject) that are available in all other displays with SDs
    - SD selection is synchronized across Map, SD List, and Waveform Display, highlight SDs with same selected color as in other displays; selected SDs are highlighted in blue
- The Analyst can zoom and scroll the time axis of the FK Beam & Traces panel in the same manner as in the Waveform Display (same hotkeys)
- The following zoom/scroll options are available (same as Waveform Display (e.g., hotkeys & drag))
    - Amplitude auto-scaling updates as you zoom/scroll appropriately for beam and fstat, stays fixed for azimuth & slowness traces
- If a prediction is extrapolated (isExtrapolated = True with FeaturePrediction object) the predicted and residual values are grayed out within the FK measurements table beneath the larger FK spectrum image
- A toast notifies the user while attempting to drag the FK Spectrum window duration below the 1s limit within the FK Beams and Traces interface
- Removed deprecated toolbar from FK thumbnails toolbar and replaced with new toolbar in use across other UI displays

Accept FK

- Implemented acceptFK operation to allow analysts to accept an FK and update its respective azimuth & slowness feature measurements
- Analysts can "Accept" the current azimuth/slowness measurement for a SD in any of the following ways, to update the azimuth/slowness feature measurements in signal detection hypothesis to the current values in the FK display:
    - Using "Accept" dropdown to accept all selected FKs (Accept → Selected)
    - Using "Accept" dropdown to accept all visible FKs for the current filter (Accept → Visible)
    - Clicking Accept button above larger FK spectrum image
    - Clicking Accept icon within any FK thumbnail
    - When analysts accept an FK via any of the above mechanisms the accept icon within the individual FK thumbnail & Accept button will update to a green color

- The Analyst can view which Signal Detection FK measurements have been "accepted" by visual highlighting of the accept icon on the FK thumbnail
    - When the FK has been accepted the accept icon turns green
- Updated to allow analysts to re-accept FKs after changing measured az/slow values
    - After an analyst has accepted an FK, if they change the az/slow measured values by clicking anywhere in the larger FK spectrum image, the FK is updated to be unaccepted
    - Analysts can re-accept the new FK if they choose to keep the updated az/slow measurements
- Updated accept FK behavior for the following use cases:
    - If a measured value does not exist, accepting an FK stores the peak azimuth/slowness generated by the system to the FMs of the SDH
        - When this occurs, the peak value becomes the measured value as well and the measured value (black dot) is displayed on top of the peak value (white dot) in the larger FK spectrum image
    - If a measured value exists but the analyst does not change it, accepting an FK stores the existing measured value to the FMs of the SDH
        - When this occurs, the measured value (black dot) should remain in its original location within all FK images
    - If the analyst makes a new measured value, accepting an FK stores the updated measured value to the FMs of the SDH
        - When this occurs, the measured value (black dot) updates to the new location in the FK thumbnail
- Analysts can load the last accepted FK from the signal detection using a 'Use Last Accepted' button within the FK Display
    - The FK display updates to show the FK & FK measurements associated with signal detection (e.g., thumbnail, tables, measurements, etc.)

FK Beams and Traces

- The Analyst can view the FK beam computed using the currently selected FK azimuth/slowness measurement and corresponding waveform traces for peak Fstat, Azimuth, and slowness in the FK Beam & Traces interface
    - The Analyst can view the associated Signal Detection marker (time and phase) on the FK beam waveform.
    - The FK Beam is auto scaled to the absolute minimum or maximum of the waveform in the plotted range (i.e., like auto-scale in Waveform Display)
- The analyst can view the lead, duration, and step size for the currently computed FK spectra within the FK beams & traces panel toolbar component
    - As FK display size is adjusted, orientation of the FK display adjusts to push the FK band previews and table below the larger main FK spectrum & FK beams & traces panel shrinks to the appropriate size (e.g., display adjusts to column layout)
    - Step size is shown as vertical dotted lines on all the FK beams & traces time series plots, separated by a distance equal to the step size of the currently computed FK
        - Analyst can toggle on/off step size markers within the FK beams & traces toolbar

- The Analyst can adjust the FK lead and/or duration in the FK beams & traces panel by clicking and dragging the left/right edge of the FK computation window
- The Analyst can show or hide the FK Beam & Traces panel by clicking the chevron icon in the title bar
- The Analyst can view the FK computation time window graphically on the FK beam and traces measurements
    - The Analyst can control which FK spectrum (from the time series of FK spectra) is displayed in the main FK Spectrum by clicking and dragging the central area of the FK time window graphic.
    - When the Analyst moves the FK time window graphic, the time window snaps (left side of FK time window) to align with the nearest FK computation time window in the FK time series (left edge aligns with dotted vertical lines representing step size) and the main larger FK Spectrum image & thumbnail in thumbnail panel is updated to display the FK spectrum computed at that time
- The Analyst can interact with the Signal Detection marker within the FK beams & traces panel the same way they can in the Waveform Display
- Manually scaled amplitudes (via y + drag) for FK beams and traces within the FK beams and traces interface can be reset with the alt/option + shift + y hotkey that is utilized to reset amplitudes in the Waveform Display
- The Analyst can apply a waveform filter from a configured list of filter definitions to the FK beam within the FK beam & traces interface.
    - FK filter definitions (filters) are populated based on the selected Filter List within the Filter List Display

FK Parameters Popup

- The Analyst can open an FK Parameters popup by clicking on the settings button (gear) to popup a dialog with allows users to modify the following FK parameters:
    - Channels
    - FK Spectrum Window
    - Prefilter
    - Normalize waveforms
    - FK Band
    - FK Grid
    - FK Spectra & Traces window - lead & duration, step size
    - Initial values for Channels, FK Spectrum Window, Prefilter, Normalize, FK Band, Grid, and FK Spectra Window are set to the configured values by Station and Phase
- The Analyst can set the Prefilter option from a list of filter definitions configured by StationType
- The Analyst can set the FK Spectrum Window from a list of window definitions configured by StationType
- The Analyst can set the FK Band from a list of frequency bands configured by StationType
- Analysts are able to revert the FK computation parameters to the default parameters within the FK template to re-compute an FK with those values within the FK parameters popup using a 'Reset To Default` button

- Channel input within the FK parameters popup is utilized within compute FK service call
    - Input channels that are checked by default are initially set to the configured FK template or the currently computed FK template for the visible FK
    - The input channels that are available for FK computation are based on the configured FK template for the visible FK

Non-ideal State Message Improvements

- Added the following non-ideal state messages to FK thumbnails:
    - Failed to compute due to no template available, service failure, network issue
    - Could not compute due to invalid phase or stationType not equal to array
    - When FK thumbnails are small or medium size a tooltip is displayed when hovering over the icon that states the error message described above instead of displaying the error message on the FK thumbnail image
- Improved and modified the following non-ideal state messages within FK display
    - No interval open
    - No stations loaded
    - Initial non-ideal state when event is not open
    - FK thumbnail loading

View Options

- The Analyst can view the prefilter & FK frequency band applied when the FK spectra was computed below the larger FK spectrum image
- The Analyst can view a table showing the current Predicted, Peak, Measured, and Residual values for Azimuth, Slowness (in seconds/degree), Slowness (in seconds/km), Velocity (km/s), Fstat, and Power (dB) for the larger FK spectrum image displayed
    - If no Event is open for review, the predicted and residual values are not shown
- The Analyst can view a legend via a 'Legend' button beneath the larger FK Spectrum image (below Slowness axis label)
- FK Thumbnails
    - The Analyst can select to show or hide FK band thumbnails (by clicking on the accordion control) computed at a set of configured frequency bands, sorted by order defined in configuration
    - The Analyst can limit the set of FK thumbnails shown by using filtering options. Options available are the following:
        - All, Open Event, Key Activity Phases, Needs Review, Custom; default is filter by "Key Activity Phases"
    - The Analyst can adjust the size of the FK thumbnail images using a drop-down menu including options for small, medium and large
    - The Analyst can adjust the horizontal size of the FK thumbnail panel within the Azimuth/Slowness Display.

- The Analyst can hide FK thumbnails from the current view using an option on the FK thumbnail (e.g. an "X") to remove the FK thumbnail from the current view

Map Display

- Station z-indexing have been updated to be above z-indexing of sites such that when overlapping stations & sites exist, the stations will be above the site.
- Events, SDs, stations can be multi-selected using ctrl+click within the Map Display

Signal Detection List Display

- Users can use alt/option + click hotkey to automatically open the existing SD details menu via the SD List Display

Waveform Display

General

- Trimmed raw waveforms are created & displayed immediately in the appropriate station row when analysts create new SDs associated to a raw channel or modify an existing SD's time beyond a configurable time period
- When feature predictions are loading (anytime), a non-ideal loading state is displayed in the Waveform Display
  - When returning from that non-ideal state, the waveform display properly aligns on the chosen phase
- Waveform Display time axis & measure window labels get appropriately scaled down when Waveform display shrinks in size
- SD/waveform selection enhancements
  - When analysts select waveforms, any associated SDs are also selected
  - When analysts select SDs, any associated waveforms are also selected
  - Shift + click or mod + click allows analysts to select multiple SDs and waveforms simultaneously
  - Clicking a SD or a waveform without the above modifier key replaces the selection of SDs and waveforms, i.e.,
    - If an SD is selected and an analyst selects a waveform, the waveform selection overrides the SD selection
    - If a waveform is selected and an analyst selects an SD, the SD selection overrides the waveform selection
- Analysts can select a single waveform (e.g., channel segments) by clicking it (non-overlapping case) or click on a set of overlapping waveforms in the Waveform Display
  - When waveforms are overlapping, split mode expands each overlapping waveform into their own rows, allowing analysts to select waveforms; clicking on a waveform row selects that waveform & immediately hides the expanded waveforms

Event Beamforming

- Analysts can create event beams using the current phase and pre-configured event beamforming parameters using the configured hotkey (b) for selected stations when an event is open
    - The Analyst can select Station rows (via the existing station selection functionality) in the Waveform Display to control which Stations are used when creating Event beams for the current open event and selected phase
    - If no Stations are selected, GMS creates Event beams for all loaded array Stations that do not have an associated Signal Detection for the current Event for the currently selected phase.
- Analysts can create event beams using the 'Event Beam' button (that opens up the Create Event Beam dialog) for selected stations when an event is open using manually adjusted parameters from the create event beams dialog
    - Added validation within Create Event Beam Dialog when users do not meet the configured minimum threshold of selected channels across a single station, select channels with inconsistent types across a single station, and select channels with inconsistent sample rates across a single station when choosing to change the input channels of an event beam
- Analysts can use the beamforming hotkey or dialog, along with their selection of stations/channels to view UI created event beams in the Waveform Display with an event open
- Analysts can select a single Event beam in the Waveform Display to view Processing Masks associated with that beam on raw Channels
- Analysts can create new SDs on event beams via the create SD hotkeys or the right-click context menu options within the Waveform Display
- Analysts can select a single Event beam the Waveform Display to view (canned) Processing Masks associated with that beam on raw Channels
- Analysts can select a single Event beam in the Waveform Display to visualize which raw Channels that contributed to that beam
    - Raw channels that contributed to the event beam have a 'BEAM INPUT' label in the station label
    - Other raw channels that did not contribute are dimmed
- Refactored event beam dialog logic to change current phase after 'Create Beam' button pressed
- When event beams load (bridged/UI created), the station label in the Waveform Display updates appropriately
    - When event beam(s) are the only derived waveforms in the station row, the station label reflects the added beam channel, e.g., PDAR beam.SHZ
    - When event beam(s) are added to a station row with existing derived waveforms, the station label updates to reflect the added beam channel
    - When an analyst opens an event, the Waveform Display displays all Event beams (bridged only currently) for the currently open event overlaid with other waveforms in the appropriate station row
- Improved UX for beamforming error handling; error messages batched
    - When validation or configuration issues occur:
        - A toast message exists that states: There was a problem with configuration for stations: X, Y, Z

        - A more detailed console log exists that provides exact issue that occurred
    - When system error occurs (e.g., couldn't retrieve predictions):
        - A toast message exists that states: There was an error creating event beams for stations: X, Y, Z
        - A more detailed console log exists that provides exact issue that occurred
    - 65 Batch beamforming error messages has been updated to include event hypotheses, feature predictions, and beamforming template information
    - Updated Event Beam dialog to show warning/error messages when data is still loading or when errors occur
    - When users press 'b' hotkey without an event open, an info toast message occurs
    - When analyst presses beamforming hotkey (b) and either station/channel validation fails or data necessary to beam is still loading or in error, create event beam dialog opened to allow users to deconflict their selections or choose to proceed with event beamforming with available data
    - When users multi-select stations, some of which are already have associated signal detections of phase attempting to beam for, and some that don't, an info toast message occurs
- Implemented better UX surrounding the exclusion of non-array stations from dialog, user selection, event beam creation
    - When analysts use the event beam hotkey with 3C stations selected, the event beam dialog popups up and shows the selected station in the Input station selection area. When this occurs:
        - 3C station name tag is colored red
        - An error message exists in the footer error message area of the Event beam dialog
        - Users are prohibited from beaming with 3C stations selected

Rotation

- The Analyst can adjust Waveform Rotation parameters by pressing the ‘Rotate Waveforms’ button in the Waveform Display toolbar that opens up the "Rotate Waveforms" dialog:
    - Input Signal Detections
    - Input Stations
    - Input Channels
    - Phase
    - Steering
    - Azimuth
    - Measured Azimuth
    - Waveform lead and duration
    - Interpolation method
- The Analyst can select one or more Signal Detections and select a context menu option on the existing Signal Detection context menu within the Waveform Display to create rotated waveforms using the associated Station, Arrival Time, and measured Azimuth (or predicted azimuth if not available) of each Signal Detection
    - Action targets exist within Waveform Display for this menu option using existing SD selection action target code for dimming/highlighting

- Updated maskAndRotate2d operation to create a trimmed waveform containing only the samples within the rotated waveform's time interval
- Rotation dialog updates
    - If the analyst selects multiple channels across multiple stations and presses the configurable rotation hotkey (r), the ‘Rotate Waveforms’ dialog pops up, an error message occurs in the dialog stating they have invalid selection, and the analyst must deconflict their selection prior to being allowed to rotate waveforms
    - If the analyst selects more than two channels within a single station and presses the configurable rotation hotkey (r), the ‘Rotate Waveforms’ dialog pops up, an error message occurs in the dialog stating they have invalid selection, and the analyst must deconflict their selection prior to being allowed to rotate waveforms
    - If the analyst selects stations/channels and signal detections, and analyst presses the configurable rotation hotkey (r), the 'Rotate Waveforms' dialog pops up and defaults to `Using selected signal detection` mode
    - Update rotation dialog to use configured values from rotationTemplate where appropriate
    - Rotate waveform dialog notifies the analyst when any two pairs of channels selected for waveform rotation have:
        - A location outside of the configured Rotation definition location tolerance
        - Sample rates that differ by more than the configured Rotation definition sample rate tolerance
        - Orientation angles that are not orthogonal by more than the configured Rotation definition orientation angle tolerance
        - Vertical orientation angle greater than the configured Rotation definition orientation angle tolerance

Signal Detection Creation

- The UI creates configurable waveform segment descriptor immediately after an analyst creates new SDs on raw channels
- When analysts create new SDs in Waveform Display via either right-click context menu options or hotkeys and an event is open, newly created SDs are automatically associated to the currently open event
    - If an event is not open, the newly created SDs are not associated to any event
    - Newly created SD is time-defining for the currently open event
    - Newly created SD's FK is automatically shown when its created & associated to the currently open event
- Analysts can press configurable hotkey ctrl + e or ctrl + shift + e anywhere on a station row/raw channel row in the Waveform Display to create a new signal detection, when this occurs the Set Phase menu automatically opens and allows them to choose a phase of their choosing

Workflow Display

- OpenAnything dialog
  - OpenAnything focus changes with tab/down arrow key to move you down the list
  - OpenAnything focus changes with shift + tab/up arrow key to move you up the list
  - The OpenAnything dialog's Station Group dropdown has been updated to include a loading indicator when it is loading the configured station group list

Undo/Redo Display

- An analyst can undo/redo beamforming within the Undo/Redo Display or via global hotkeys
  - An entry is added to the undo/redo stack when analysts beamform
  - Undo/Redo display or an element within it gains focus when user clicks anywhere within the display

UI General

Software Updates

- Upgraded UI to Blueprint 5.7.2, Yarn v4, ESLINT & Prettier, Node to latest LTS, lerna, rimraf, husky, lint-staged, jest-html-reporter
- Upgraded Cesium 1.79.1 to Cesium 1.109.0

General

- Analysts can delete selected Signal Detections using the configured hotkey backspace within the Waveform, SD List, and Map Displays
- Migrated 3 useEffects to use new redux middleware pattern to provide potential performance improvements and reduce render thrashing
- Converted remaining complex enzyme tests to react testing library and remove deprecated enzyme package
- An environment variable exists to turn pre-caching on/off in production/local deployment environments (defaults to on in production mode)
- UI Loading indicator number numerator/denominator (e.g., 300/300 loading: Complete) are cleared to 0 when changing/closing intervals
- UI can create derived channels
  - Rotated channels describing the channel created by applying the RotationDefinition to the provided input channels collection
  - FkSpectra derived channels describing the channel created by applying the provided FkSpectraDefinition to the provided input channels
- All UI SOH code has been removed from the Typescript GMS code base

- Display or element within it gains focus when user clicks anywhere within the display for Filter List, Station Properties, Map, and Undo/Redo Displays
- When analysts change the phase list within the current or set phase menus within the SD List, Map, and Waveform Display:
    - The default phase is updated & users cannot remove it from the favorites within the set phase menu or current phase menu
    - When the default & current phases are different the current phase menu shows a hotkey hint next to the appropriate default phase for that phase list
    - The SD right-click context menu options in the Waveform, SD List, and Map Displays are updated appropriately to show the default configured phase for that phase list
    - Current phase should remain unchanged
- All outstanding (e.g., stale) network requests are cancelled (or handled appropriately when they resolve) when changing/closing intervals within the Workflow Display
- Performance of publishing filtered derived channels was improved by ~15% (for single filter operation) and ~25% (overall filtering)
- UI retrieves raw channels immediately on load instead of when a user expands a station
- Users can save their current UI state & waveform store to a file via the 'Save to file' option in the user application menu that can be reused within the GMS application
- Implemented a pre-event cache that caches signal detection predictions for increased performance when opening events
- The following non-ideal states are handled separately in the Filter List, Station Properties, Event List Display, and Undo/Redo Displays:
    - Loading
    - Empty (e.g., no data)
    - Error
- Command Palette
    - Command palette focus changes with tab/down arrow key to move you down the list
    - Command palette focus changes with shift + tab/up arrow key to move you up the list

Beamforming infrastructure

- Beamforming utility, processor, and C++ code updated to track provenance of channels with missing data that were not utilized within the beamforming calculation
- C Beamforming algorithm
    - Added sharable utilities for filtering, qc, and tapering
    - Update C beamforming code to track channels and time ranges when channels were omitted from the beamforming calculation and provide them as output
- Developed WASM infrastructure
    - Hooked up UiBeamProcessor maskAndBeamWaveforms operation to WASM infrastructure to create masked and beamed waveforms for the provided and BeamDefinition, BeamType, and time interval using UiChannelSegment objects produced by the provided Channel collection

    - Created the utility layer that is responsible for translating from Typescript memory to WASM memory to invoke the WASM beamforming algorithm
    - Updated the C++ layer, WASM, the UiPlaneWaveBeamUtility maskAndBeamWaveforms() and the UI Beam Processor maskAndBeamWaveforms() operations to accommodate updated output structure containing channel names and time ranges when the channel was not utilized within the beamforming calculation; utilized for populating missingInputChannels within channel segments
- C++ & WASM beamforming algorithms verified to produce same performance and results as C beamforming algorithm for base example & processing masks implementation
- Associated the applied processing masks for each beam with the resulting derived channel segment
- createPreconfiguredEventBeams and createEventBeam operations have been updated to:
    - Ensure beamtype = EVENT when replacing previously created event beams for the same event, station, and phase types for channels and channel segments
    - Only replace Feature measurements that have previous channels & channel segments for the same event, station, phase type, and beamtype = EVENT, not ALL FMs for an SDH
    - Remove derived waveforms created from event beams properly from UI state
- Channel prioritization logic has been updated to check if the chosen channel has enough channels to meet the minWaveformToBeam attribute within the station's beamforming template
    - If meets minWaveformToBeam attribute, continues to use that channel for beamforming operation
    - If not, moves onto the next channel in the prioritization list, performing the minWaveformToBeam check until it finds a channel in the list for use in the beamforming operation
    - If none of the configured priority channels meet the minWaveformToBeam check, UI displays a toast indicating to the user that it was unable to compute an event beam for that station

COI

- Updated Typescript COI model to support new filter definition COI to support advanced filtering (autoregressive & phase match filtering)
- UI Typescript model is aligned with new RotationDefinition COI
- UI Typescript COI Processing Mask Definition COI has been updated to include the taperFunction attribute
- UI Typescript model updated to align with new FK COI
- UI Typescript Channel Segment COI updated to include the attribute missingInputChannels

Configuration

- A menu option exists in the app menu to set user preferences
- Updated the Preferences dialog to not automatically apply the changed user preferences to the UI until users hit an apply button.
    - The Preferences dialog has been updated to include Apply and Cancel buttons
    - User preferences are only updated if the user presses the apply button

    - A loading indicator has been added to the apply button while user preferences are loading and updating
- Configured prefilter definitions associated with the FK preview frequency bands exists in UI Processing Configuration
- Consolidate and re-organize UI Processing configuration to make it easier for system maintainers to understand and use
    - Moved interval and num channels specific configuration into analyst-settings-ui.json file to consolidate UI processing/specific display configuration into a single file location
    - Removed unused values & unused prevent default hotkey implementations
- A default rotation phase exists within UI Processing Configuration, configured by Analysis Activity
- Default values for waveform rotation lead time, duration, and interpolation method exist within UI Processing Configuration
- When the default configured phase for a phase list is reconfigured it updates the default & current phases to that configured phase, context menu options within the SD List, Map, and Waveform Display are updated appropriately, and analysts can modify the phase to the current/default phase via hotkeys/right-click context menu options
- UI is integrated with the getFKSpectraTemplates signal enhancement configuration service to retrieve FK configuration on how to compute FKs for a particular station and phase on load (e.g., when opening time interval either via workflow or openAnything) and when loading additional stations
- A configurable color exists to color site array lines that provide visual array geometry in the Map Display

FK infrastructure updates

- Created wrapper around fftw library for use within GMS analysis algorithms
- Implemented utility layer that is responsible for translating from Typescript memory to WASM memory to invoke the WASM FK algorithm
- Created operation to compute an FK spectra using utility layer
- Updated how FK beams are stored in UI state such that they're added to the UI channel segment record where the index is the signal detection ID
- Updated FK C++ layer to properly pass in processing masks and taper definitions to the FK C algorithm
- Created the utility layer that is responsible for translating from Typescript memory to WASM memory to invoke the WASM FK algorithm

Hotkeys

- A configurable hotkey (backspace) exists in UI processing configuration for deleting SDs
- Configurable hotkeys, ctrl + e & ctrl + shift + e exist in UI processing configuration (ui-analyst-settings.json) that allows analysts to create a new SD with a phase of their choosing associated/not associated to a waveform
- A configurable hotkey, backspace (delete button on mac), exists in UI processing configuration (ui-analyst-settings.json) for deleting SDs

- A hotkey (r) for creating rotated waveforms using the default rotation phase exists and is configurable within UI processing configuration

Rotation infrastructure updates

- Update GMS C rotation algorithm to handle appropriately applying a taper and processing masks prior to rotating waveforms; uses shared qc & tapering utilities
- Develop WASM infrastructure
    - WASM Rotation algorithm verified to produce same results as C/C++ rotation algorithm
    - Created the utility layer that is responsible for translating from Typescript memory to WASM memory to invoke the WASM waveform rotation algorithm
    - Hooked up UiRotationProcessor maskAndRotate2d operation to create a masked and then rotated waveform for the provided for the provided RotationDefinition, time interval, and input channels
    - Update Typescript to WASM layers inputs to take an optional Taper definition for use in applying processing masks when computing rotated waveforms
- Rotation utility, processor, C++, and C code updated to track provenance of channels with missing data that were not utilized within the rotation calculation
- Rotate2dForChannels & rotate2dForSignalDetection operations have been updated to add rotated waveforms to SDH FMs and replace waveforms or unreferenced rotated channels and waveforms previously created for the same station, phase, channel orientation, time, azimuth tolerance combination, and whether unassociated or associated to the currently open event
- Update rotation utility & C++ layers to provide processingMasksByChannelMap object as input

Service Integrations

- Updated UI to replace existing filter configuration services filterDefinitionsByUsageByChannelSegment and FilterDefinitionByUsageBySignalDetectionHypothesis with new service getDefaultFilterDefinitionsByUsageMap when loading a time range, adding new stations, loading new signal detections, creating/modifying signal detections, loading event data and applying filters
- Integrated UI with findEventBeamsByEventHypotheseAndStations service to retrieve bridged event beams on load, pan, and when adding a station
- Integrated UI with getRotationTemplates service to retrieve rotation configurations for stations and phase on load and when adding a station
- Integrated UI with getDefaultFilterDefinitionsByUsageMap service to retrieve default named filters on load and when adding a station; will replace the existing use of the
- UI is integrated with the getFkReviewablePhases Signal Enhancement Configuration Service to retrieve the phases by station that the analyst must review Fks for
- Migrated data fetching endpoints to more maintainable and extensible async thunk pattern
    - Async thunk is a method we use to manage asynchronous operations such as fetching data from our endpoints

Set Phase & Current Phase menus

- Set Phase & Current Phase focus changes with tab key/arrow down to move you down the list across Waveform, SD List, and Map Displays
- Set Phase & Current Phase focus changes with shift + tab key/arrow up to move you up the list across Waveform, SD List, and Map Displays
- Hotkeys for opening the Set Phase and Current Phase menus have been updated to ctrl+shift + P and ctrl+ P respectively within the Waveform, SD List, and Map Displays
- Hotkey hints on the Set Phase and Current Phase titles have been updated to ctrl + shift + P and ctrl + P

Backend

Updates

- Upgraded to Gradle 8.3
- BOM update to spring-boot 3.2

General

- Removed SOH code from the code base
- Removed station and phase from Beamforming Template configuration parameters
- Added ability to view LocOO3D (Event Relocator Service) logs in GMS
- Added startup probe to Oracle to enable safer startup of deployments
    - Added liveness/readiness to following services to allow safer startup of deployments:
    - Bridged Data Source Simulator
    - Waveform Manager Service
    - Event Manager Service
    - Postgres
    - Station Definition Service
    - Signal Detection Manager Service
- Added error handling for improperly formatted waveform files
- Adjusted AmplitudeMeasurementValue COI class
- Added AMPLITUDE filters to "Find Filter Definitions for Signal Detections" bridged response
- Added new FeatureMeasurementType, ROOT_MEAN_SQUARE
- Changed FilterDefinition usage literal from MEASURE to AMPLITUDE
- Updated frequencyRange to fkFrequencyRange in fkSpectraParameters
- Added --config option to ian_sim_deploy.py
- Fixed "Get Rotation Templates" endpoint to accept station version references
- Implemented the Event Beam simulator
- Added nominalSampleRateHz and nominalCalibration attributes to fapResponse objects
- Migrated Postgres enums in schema to Ordinals

- Added configuration flag option to switch all canned Processing Mask processing operations to EVENT_BEAM
- Implemented bridging and conversion of instrument responses files to GMS COI.

Services

- Memory
    - Increased memory limit of Signal Enhancement Configuration Service
    - Profiled and set memory limits for Station Definition Service, Event Manager Service Waveform Manager Service, and the Signal Detection Manager Service
- Implemented liveness/readiness checks in the Signal Enhancement Configuration, Signal Feature Measurement Configuration, Feature Prediction, and Event Relocation Services. Liveness/readiness is now implemented in the Workflow Manager, SEC, SFMC, FP, and Event Relocation Services.
    - This means that when you start up an instance/deployment, you will need to make sure the pods for workflow-manager-service , signal-enhancement-configuration-service, signal-feature-measurement-configuration-service, feature-prediction-service, and event-relocation-service all read 2/2 before you start using the deployment. Pods reading 1/2 means Kubernetes successfully stood up the Istio sidecar, but the service is not alive and ready for use.
- Event Relocation Service added with following endpoints:
    - Get Event Relocation Processing Definition
    - Get Event Relocation Predictor Definitions by Phase
    - Get Default Defining Feature Maps
- Implemented the Signal Feature Measurement Configuration Service and associated components/classes
    - Implemented "Get Default Stations to Measure by Amplitude Type" endpoint
    - Implemented "Get Amplitude Measurement Definitions" endpoint
    - Implemented "Get Amplitude Measurement Conditioning Templates"
    - Added configuration for AutoRegressive and Phase-Match filters. Information for these filters can now be retrieved from Signal Feature Measurement Configuration Service endpoints
- Signal Enhancement Configuration Service
    - Implemented "Get Rotation Templates" endpoint
    - Implemented "Get Default Filter Definitions by Usage Map" endpoint
    - Added getFkSpectraTemplates() endpoint
    - Removed "Station Group" as a selector from the "Get Processing Mask Definitions" endpoint
- Implemented the relocate() endpoint in the Event Relocation Service.
- Implemented "Find Event Beams by Event Hypotheses and Stations" endpoint in Waveform Manager Service

Known Issues:

Event List Display

- When hide/show event layers with events selected, selection isn't always fully preserved
- Users are prevented from creating events erroneously after entering an invalid time, latitude, longitude, or depth within the Create Event dialog

FK Display

- FK endpoint is a prototype endpoint not designed to be fully operational, as such, it should be considered unreliable and may not always return FKs
    - Does not return FKs for 3 component stations
    - Does not return FKs for unknown (e.g., tx, Tx, etc.) phases
    - May fail intermittently
- FK Parameters popup Compute button is not fully functional with the prototype endpoint and as such should not be tested
- When there is only one FK left within a filter (e.g., Key Activity Phases) and there is an attempt to delete it, the FK isn't removed from the FK display and can be interacted with
- FK display will crash when dragging lead and then attempting to recompute an FK with updated lead

Map Display

- Deleted/Rejected events don't turn orange on the Map to indicate their open
- Users are prevented from creating events erroneously after entering an invalid time, latitude, longitude, or depth within the Create Event dialog

SD List Display

- Users are prevented from creating events erroneously after entering an invalid time, latitude, longitude, or depth within the Create Event dialog

Waveform Display

- Waveform display horizontal scrolling from left to right has performance issues (Firefox – noting for sake of consistency):
    - Rendering lag with SDs and waveforms where they sometimes appear out of sync (happens in Chrome too but is less severe)
    - Station label disappears sometimes and/or waveforms render beyond it (only happens in Firefox)

- When users pan where QC segments exist, all QC segments are replaced with only the latest results; this results in QC masks disappearing on pan. This will be fixed when UI is connected to the real endpoint and QC segment ids are being properly updated.
- Rotation button was added but is not currently fully functional, so should not be tested
- Station dropdown doesn't return focus to the Waveform Display
- Esc doesn't close the Event Beam & Rotation dialogs unless they have focus
    - When dialogs close, doesn’t return focus back to the Waveform Display
- Event Beam Dialog pre-filter option is disabled intentionally (as are the use of prefilters in beamforming templates) until refactor the prefilter options & implementation (planned fix for next PI)
- When an event beam is selected and users beam for the same event, station, and phase, such that the event beam will be replaced, the selector indicator (and status bar) still indicate the waveform as selected, the beam input labels are still displayed, and the non-contributing channels are still dimmed (planned fix for next PI)
    - Work-around is to just double-click the selector to de-select everything
- Processing masks are not being applied correctly within the beamforming algorithm – this will show up visually as a beam sometimes being created erroneously where entire processing masks exist for the given time range (i.e., so shouldn't exist). Note this only occurs on array stations that have canned QC masks (example: ASAR).
- Users are prevented from creating events erroneously after entering an invalid time, latitude, longitude, or depth within the Create Event dialog
- Modifying an SD or opening/closing/re-opening an event can create multiple copies of the same bridged event beam
- Double-clicking on a QC segment input within the processing mask details menu does not always reliable work unless you're near where the QC segment exists

Undo/Redo Display

- See issue above related to double-click & undefined showing up in history stack
- Sometimes multiple stack entry is not properly dimmed when undone

UI General

- Occasionally, filter definition retrieval from the database fails for channel segments; this is due to a serialization/deserialization failure when a value retrieved from the backend (e.g., kWeight) is set to Infinity or -Infinity. This error appears as a failure in Developer Tools.
- Notable performance degradation has been observed while working with tearable tab displays
- Selector across displays leaves a component residue when use the 'de-select all' button option for any selected object type
- Clear layout option doesn't revert you back to the current layout, simply refreshes the layout
- When multiple versions of the GMS open, when try to go to another deployment, will receive a 'User profile error message' and have to refresh before the displays fully load
- Sometimes loading spinner never seems to complete on its last load cycle (e.g., 599/600)

- Out of memory issues observed when opening/closing several intervals; improved in current release but still requires more work
    - Sometimes can cause the UI to eventually crash after 7-10 intervals are open, especially when UI console open, but not always repeatable

Backend

- Kafka pod memory limits are not set properly in the helm chart and need to be overridden to prevent kafka from crashing with OOM. Add *--set kafka.controller.resources.limits.memory=2200Mi* when installing
- Known difference in data between corporate and containerized Oracle. Only corporate Oracle should be used for validation purposes
- Canned Processing Mask Capability will return Processing Masks that may not correspond to the canned QC segments that are being bridged
- Event Manager Service:
    - Occasionally seeing failures in event endpoints with the following error message:
    - originDao and netMagDaos originIds must match
    - Feature Prediction Service returning incorrect times for phase predictions - issues in calculation.
    - Faceting does not work as expected
- Intermittent issues in user manager service
- Many response bodies do not match the architecture guidance as written
- Transient issue in Signal Enhancement Configuration Service with following error "beamType cannot be case to phaseType"
- Signal detection hypotheses not being returned consistently
- Different channels are being returned from the same request
- Named Filter Definition attributes not being bridged correctly
- More signal detections are being returned than expected from "Find Event with Detections and Segments by Time" (and possibly other endpoints).
- Some Channel Segment Descriptors are not being cached correctly resulting in empty returns from "Find Waveforms by Channel Segment Descriptors"
- Some Signal Detection Hypotheses are not being cached correctly resulting in empty returns from "Find Signal Detections by ID"
- It's possible that two configurations could be resolved and combined for a single item if one is misconfigured (e.g., a typo)
- Memory issues can cause restarts