

# Forecasts

Universal Controller 7.5.x

© 2024 by Stonebranch, Inc. All Rights Reserved.

# Table of Contents

1	Displaying Trigger Forecast Information.....	4
2	Displaying Trigger Forecast Information.....	5
2.1	Overview .....	5
2.2	Forecast Calendar.....	5
2.3	Forecasts List.....	6
2.4	Forecast Details .....	7
2.4.1	Forecast Details Field Descriptions .....	8
2.5	Forecast Calculation.....	9
2.6	Forecast Re-Calculation .....	10
2.7	Setting up Forecasting.....	11
2.8	Next Scheduled Time.....	11
2.8.1	Overdue Timers.....	12
2.9	List Qualifying Times .....	13

# 1 Displaying Trigger Forecast Information

---

- [Overview](#)
- [Forecast Calendar](#)
- [Forecast List](#)
- [Forecast Calculation](#)
- [Forecast Re-Calculation](#)
- [Setting up Forecasting](#)
- [Next Scheduled Time](#)
- [List Qualifying Times](#)



The information on these pages in PDF form can be found [here](#).

## 2 Displaying Trigger Forecast Information

### 2.1 Overview

Four methods are available for displaying forecasting information on time-based triggers (Time, Cron, and Temporary) and the tasks they launch:

- [Forecast Calendar](#) displays a calendar showing tasks scheduled to run based on Time, Cron, and Temporary triggers. Where data is available, the estimated end time for each task also is calculated and displayed.
- [Forecasts List](#) displays a sequential list of the tasks shown in the [Forecast Calendar](#).
- [Next Scheduled Time](#) field in Time, Cron, and Temporary trigger Details identifies the next time a trigger will launch its task(s).
- [List Qualifying Times](#) button in Time and Cron triggers Details displays a list of the next 30 qualifying dates and times.

Each of these methods is described below.

See [Forecasting a Workflow for a Specific Date/Time](#) for displaying Workflow forecast information.

### 2.2 Forecast Calendar

For [enabled](#) Time, Temporary, and Cron triggers where forecasting has been specified, Universal Controller writes an entry to the Forecast Calendar (and the [Forecasts List](#)) for each time that a trigger task is scheduled to run within the next  $N$  days, where  $N$  is the forecast period specified in the [Forecast Period in Days](#) Universal Controller system property.

To display the Forecast Calendar, from the [Automation Center](#) navigation pane select **Triggers > Forecast Calendar**.

Dashboards <span>×</span> Triggers <span>×</span> Forecast Calendar <span>×</span>						
< Nov 2022 >						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
		08:00pm stonebranch-windowstaski-01	08:00pm stonebranch-windowstaski-01	08:00pm stonebranch-windowstaski-01	08:00pm stonebranch-windowstaski-01	08:00pm stonebranch-windowstaski-01
08:00pm stonebranch-windowstaski-01	08:00pm stonebranch-windowstaski-01	08:00pm stonebranch-windowstaski-01	08:00pm stonebranch-windowstaski-01	08:00pm stonebranch-windowstaski-01	08:00pm stonebranch-windowstaski-01	08:00pm stonebranch-windowstaski-01
08:00pm stonebranch-windowstaski-01	08:00pm stonebranch-windowstaski-01	08:00pm stonebranch-windowstaski-01	08:00pm stonebranch-windowstaski-01	08:00pm stonebranch-windowstaski-01	08:00pm stonebranch-windowstaski-01	08:00pm stonebranch-windowstaski-01
08:00pm stonebranch-windowstaski-01	08:00pm stonebranch-windowstaski-01	08:00pm stonebranch-windowstaski-01	08:00pm stonebranch-windowstaski-01	08:00pm stonebranch-windowstaski-01	08:00pm stonebranch-windowstaski-01	08:00pm stonebranch-windowstaski-01
08:00pm stonebranch-windowstaski-01	08:00pm stonebranch-windowstaski-01	08:00pm stonebranch-windowstaski-01	08:00pm stonebranch-windowstaski-01			

To display Details about an entry in the Forecast Calendar, click the entry. A [Forecast Details](#) pop-up displays. (You also can display Forecast Details by clicking an entry in the [Forecasts List](#) .)

To refresh the forecast data (for the displayed month only), click the Refresh icon.

## 2.3 Forecasts List

The Forecasts list displays information about every entry in the [Forecast Calendar](#) , plus information on tasks within a Workflow launched by a trigger.

To display the Forecasts List, from the [Automation Center](#) navigation pane select **Triggers > Forecasts**.

Trigger	Task	Task Type	Workflow	Launch Time	End Time	Run/Skip Evaluation	Simulation
stonebranch-timetrigger-02	stonebranch-timertask-01	Timer		2023-03-08 15:00:00 -0500	2023-03-08 15:00:00 -0500	Run	No
stonebranch-timetrigger-02	stonebranch-timertask-01	Timer		2023-03-08 17:00:00 -0500	2023-03-08 17:00:00 -0500	Run	No
stonebranch-crontrigger-01	stonebranch-windowstask-01	Windows		2023-03-08 20:00:00 -0500	2023-03-08 20:00:00 -0500	Run	No
stonebranch-timetrigger-02	stonebranch-timertask-01	Timer		2023-03-09 09:00:00 -0500	2023-03-09 09:00:00 -0500	Run	No
stonebranch-timetrigger-02	stonebranch-timertask-01	Timer		2023-03-09 11:00:00 -0500	2023-03-09 11:00:00 -0500	Run	No
stonebranch-timetrigger-02	stonebranch-timertask-01	Timer		2023-03-09 13:00:00 -0500	2023-03-09 13:00:00 -0500	Run	No
stonebranch-timetrigger-02	stonebranch-timertask-01	Timer		2023-03-09 15:00:00 -0500	2023-03-09 15:00:00 -0500	Run	No
stonebranch-timetrigger-02	stonebranch-timertask-01	Timer		2023-03-09 17:00:00 -0500	2023-03-09 17:00:00 -0500	Run	No
stonebranch-crontrigger-01	stonebranch-windowstask-01	Windows		2023-03-09 20:00:00 -0500	2023-03-09 20:00:00 -0500	Run	No
stonebranch-timetrigger-02	stonebranch-timertask-01	Timer		2023-03-10 09:00:00 -0500	2023-03-10 09:00:00 -0500	Run	No
stonebranch-timetrigger-02	stonebranch-timertask-01	Timer		2023-03-10 11:00:00 -0500	2023-03-10 11:00:00 -0500	Run	No
stonebranch-timetrigger-02	stonebranch-timertask-01	Timer		2023-03-10 13:00:00 -0500	2023-03-10 13:00:00 -0500	Run	No
stonebranch-timetrigger-02	stonebranch-timertask-01	Timer		2023-03-10 15:00:00 -0500	2023-03-10 15:00:00 -0500	Run	No
stonebranch-timetrigger-02	stonebranch-timertask-01	Timer		2023-03-10 17:00:00 -0500	2023-03-10 17:00:00 -0500	Run	No
stonebranch-crontrigger-01	stonebranch-windowstask-01	Windows		2023-03-10 20:00:00 -0500	2023-03-10 20:00:00 -0500	Run	No
stonebranch-timetrigger-02	stonebranch-timertask-01	Timer		2023-03-11 09:00:00 -0500	2023-03-11 09:00:00 -0500	Run	No
stonebranch-timetrigger-02	stonebranch-timertask-01	Timer		2023-03-11 11:00:00 -0500	2023-03-11 11:00:00 -0500	Run	No
stonebranch-timetrigger-02	stonebranch-timertask-01	Timer		2023-03-11 13:00:00 -0500	2023-03-11 13:00:00 -0500	Run	No
stonebranch-timetrigger-02	stonebranch-timertask-01	Timer		2023-03-11 15:00:00 -0500	2023-03-11 15:00:00 -0500	Run	No
stonebranch-timetrigger-02	stonebranch-timertask-01	Timer		2023-03-11 17:00:00 -0500	2023-03-11 17:00:00 -0500	Run	No
stonebranch-crontrigger-01	stonebranch-windowstask-01	Windows		2023-03-11 20:00:00 -0500	2023-03-11 20:00:00 -0500	Run	No
stonebranch-timetrigger-02	stonebranch-timertask-01	Timer		2023-03-12 10:00:00 -0400	2023-03-12 10:00:00 -0400	Run	No
stonebranch-timetrigger-02	stonebranch-timertask-01	Timer		2023-03-12 12:00:00 -0400	2023-03-12 12:00:00 -0400	Run	No
stonebranch-timetrigger-02	stonebranch-timertask-01	Timer		2023-03-12 14:00:00 -0400	2023-03-12 14:00:00 -0400	Run	No
stonebranch-timetrigger-02	stonebranch-timertask-01	Timer		2023-03-12 16:00:00 -0400	2023-03-12 16:00:00 -0400	Run	No
stonebranch-crontrigger-01	stonebranch-windowstask-01	Windows		2023-03-12 20:00:00 -0400	2023-03-12 20:00:00 -0400	Run	No
stonebranch-crontrigger-01	stonebranch-windowstask-01	Windows		2023-03-13 20:00:00 -0400	2023-03-13 20:00:00 -0400	Run	No
stonebranch-crontrigger-01	stonebranch-windowstask-01	Windows		2023-03-14 20:00:00 -0400	2023-03-14 20:00:00 -0400	Run	No
stonebranch-timetrigger-02	stonebranch-timertask-01	Timer		2023-03-15 10:00:00 -0400	2023-03-15 10:00:00 -0400	Run	No
stonebranch-timetrigger-02	stonebranch-timertask-01	Timer		2023-03-15 12:00:00 -0400	2023-03-15 12:00:00 -0400	Run	No
stonebranch-timetrigger-02	stonebranch-timertask-01	Timer		2023-03-15 14:00:00 -0400	2023-03-15 14:00:00 -0400	Run	No
stonebranch-timetrigger-02	stonebranch-timertask-01	Timer		2023-03-15 16:00:00 -0400	2023-03-15 16:00:00 -0400	Run	No
stonebranch-crontrigger-01	stonebranch-windowstask-01	Windows		2023-03-15 20:00:00 -0400	2023-03-15 20:00:00 -0400	Run	No
stonebranch-timetrigger-02	stonebranch-timertask-01	Timer		2023-03-16 10:00:00 -0400	2023-03-16 10:00:00 -0400	Run	No
stonebranch-timetrigger-02	stonebranch-timertask-01	Timer		2023-03-16 12:00:00 -0400	2023-03-16 12:00:00 -0400	Run	No
stonebranch-timetrigger-02	stonebranch-timertask-01	Timer		2023-03-16 14:00:00 -0400	2023-03-16 14:00:00 -0400	Run	No

To display the [Details](#) about a Forecast in the list, either:

- Click the Details icon next to the **Trigger** Name to display a Forecast Details pop-up.
- Click the Forecast entry in the list to display the Forecast Details below the list.

(You also can display Forecast Details by clicking an entry in the [Forecast Calendar](#) .)

## 2.4 Forecast Details

Forecast Details displays information about the task, workflow, agent, and trigger associated with a trigger Forecast.

(For a workflow, only details about tasks and triggers are available.)

You can displays Forecast Details either by:

- Clicking an entry in the [Forecasts Calendar](#) .
- Clicking an entry in the [Forecasts List](#) .

Forecast Details
- ☐ ×

Forecast
● Child Forecast

**Details**

Task stonebranch-windowstask-01 <span style="float: right;">☐</span>	Trigger stonebranch-crontrigger-01 <span style="float: right;">☐</span>
Task Type Windows	Launch Time 2022-10-31 20:00:00 -0400
Workflow <span style="border-bottom: 1px solid #ccc; display: inline-block; width: 100%;"></span> <span style="float: right;">☐</span>	End Time 2022-10-31 20:00:00 -0400
Member of Business Services <span style="border-bottom: 1px solid #ccc; display: inline-block; width: 100%;"></span>	Run/Skip Evaluation Run
Simulation <input type="checkbox"/>	
Agent qa-win7-x64 - WIN7X64 <span style="float: right;">☐</span>	Agent Cluster <span style="border-bottom: 1px solid #ccc; display: inline-block; width: 100%;"></span> <span style="float: right;">☐</span>
Agent Variable <span style="border-bottom: 1px solid #ccc; display: inline-block; width: 100%;"></span>	Agent Cluster Variable <span style="border-bottom: 1px solid #ccc; display: inline-block; width: 100%;"></span>
	Cluster Broadcast <span style="border-bottom: 1px solid #ccc; display: inline-block; width: 100%;"></span> <span style="float: right;">☐</span>
	Cluster Broadcast Variable <span style="border-bottom: 1px solid #ccc; display: inline-block; width: 100%;"></span>

Click the Details icon next to any field to view Details of that record.

See the [field descriptions](#) below for a description of all fields in the Forecast Details.

### 2.4.1 Forecast Details Field Descriptions

The following table describes the fields and tabs that display in the Forecast Details.

Field Name	Description
<b>Details</b>	This section contains detailed information about the forecast.
Task	Name of the task selected in the Forecast Calendar. The icon is a link to the Task Details for this task.
Task Type	Task type of this task.
Workflow	For tasks included in a Workflow: Name of the Workflow in which this task is included. The icon is a link to the Workflow Details for this Workflow.
Member of Business Services	One or more <a href="#">Business Services</a> that this task belongs to.
Trigger	Name of the trigger that will launch this task (or the Workflow in which this task is included). The icon is a link to to the Trigger Details for this trigger.
Launch Time	Calculated start time of this task.
End Time	Calculated end time of this task.

Run/Skip Evaluation	<p>Evaluation, based on run/skip criteria specified for this task via the Workflow Task Details, of whether this task will run or skip when the Workflow is run.</p> <ul style="list-style-type: none"> <li>• <b>Run</b> <ul style="list-style-type: none"> <li>• A variable condition is not specified, and the forecasted task is scheduled to run based on the criteria.</li> </ul> </li> <li>• <b>Run*</b> <ul style="list-style-type: none"> <li>• A variable condition is specified, and the forecasted task is tentatively scheduled to run based on the variable data available at the time of the forecast but is subject to change at run time.</li> </ul> </li> <li>• <b>Skip</b> <ul style="list-style-type: none"> <li>• A variable condition is not specified, and the forecasted task is scheduled to skip based on the criteria.</li> </ul> </li> <li>• <b>Skip*</b> <ul style="list-style-type: none"> <li>• A variable condition is specified, and the forecasted task is tentatively scheduled to skip based on the variable data available at the time of the forecast but is subject to change at run time.</li> </ul> </li> <li>• <b>Not Evaluated</b> <ul style="list-style-type: none"> <li>• A variable condition is specified, however, an unresolved variable and/or function was detected during the evaluation.</li> </ul> </li> </ul> <p>Tasks, including Workflows, launched directly by the trigger will always have a run/skip evaluation of <b>Run</b>. Likewise, tasks within a launched Workflow that do not have any run or skip defined will always have a run/skip evaluation of <b>Run</b>.</p>
Simulation	Indication of whether or not this forecast is based on the simulated launch of this trigger.
Agent	Name of the Agent resource record that identifies the machine where the task will run.
Agent Variable	Variable that will be resolved at run time to the name of the Agent resource that identifies the machine where the task will run.
Agent Cluster	Name of the Agent Cluster resource record from which an Agent that identifies the machine where the task will run on is selected.
Agent Cluster Variable	Variable that will be resolved at run time to the name of the Agent Cluster resource from which an Agent that identifies the machine where the task will run on is selected.
Cluster Broadcast	Name of the Agent Cluster resource record that specifies the group of Agents to broadcast to. At launch time, an instance of the task will be created for each Agent in the cluster. Each instance displays separately in the Activity Monitor.
Cluster Broadcast Variable	Variable that will resolve at launch time to the name of the Agent Cluster resource record that specifies the group of Agents to broadcast to. At launch time, an instance of the task will be created for each Agent in the cluster. Each instance displays separately in the Activity Monitor.
<b>Tabs</b>	This section identifies the tabs across the top of the Forecast Details that provide access to additional information about the forecast.
<b>Child Forecasts</b> tab	For Workflows only; Displays a list of forecast information for tasks within this Workflow (see <a href="#">Forecast List</a> , below).

## 2.5 Forecast Calculation

As the tasks are run, the Controller calculates the end time of each Forecast entry. The calculation is the average run time, based on task instances that already have run. This information is updated each time you display the forecast.

As task instances run within the Controller, task instance durations are collected, allowing the Controller to calculate their average run time. The average run time is used to determine the estimated end time provided on each Forecast entry. For task instances that run within a triggered Workflow, an average start offset within the Workflow, along with the average run time, are used to determine the estimated launch time and end time.

To reset the statistics information collected by the Controller for a particular task or Workflow, use the **Reset Statistics** command under [Task Permissions](#) .

## 2.6 Forecast Re-Calculation

Certain changes in the system will automatically cause a re-calculation of forecast data. However, not all changes will result in immediate re-calculation.

Changes to the Details of an enabled trigger that impact the schedule of that trigger or the tasks launched by that trigger will result in an immediate re-calculation of the Forecast data for that trigger.

Changes to the agent, agent variable, agent cluster, agent cluster variable, or broadcast cluster fields of a task will be reflected immediately in the any forecast data referring to that particular task.

Changes to the Details of a Workflow launched by a trigger or a calendar used by a trigger (including the custom days within the calendar) will result in the forecast data of an associated trigger being flagged for re-calculation, as indicated by the Forecast Recalculation Required field. Any forecast data flagged for re-calculation will be re-calculated automatically at 12:00 a.m. (midnight) daily.

Whenever Override Calendar options are modified for a workflow, any forecast data associated with that workflow will be flagged for recalculation at the midnight refresh.

Statistics for a particular task may not be available at the time the original forecast calculation occurs. Therefore, the accuracy of estimated end times for triggered tasks, as well as the estimated start and end times of tasks launched within a triggered Workflow, may be inaccurate. The current accuracy of a Forecast record is indicated by the End Time Accuracy field. The End Time Accuracy is based upon the number of task instance runs for which historical data has been collected *at the time of forecast calculation*. It can have one of the following values.

Runs	Accuracy
0	0
1	Low
2-9	Medium
10+	High

Any Forecast data with accuracy that can be improved significantly through re-calculation will be re-calculated automatically at 12:00 a.m. (midnight) daily.

For any Forecast data for which you wish to force an immediate re-calculation, use the **Recalculate Forecast** command from the Trigger record or from the Workflow record.

### Note

By default, the Forecast Recalculation Required and End Time Accuracy columns are not included in the Forecasts list. However, you can add them to the list.

## 2.7 Setting up Forecasting

### Warning

We strongly discourage enabling forecasting for very frequent and predictable trigger schedules.

For example, if you enable forecasting on a trigger that runs every 30 seconds, that would generate - at a minimum - 89,280 forecast records, based on the default configuration of 31 days of forecasting. If that trigger launches a Workflow task, it would generate an extra 89,280 forecast records per task within the workflow.

For these types of triggers, the forecast feature does not provide much insight, yet it requires a very large amount of processing to compute.

Use the following points as a checklist when setting up forecasting:

- Forecasting is supported for the following trigger types: [Time](#) , [Temporary](#) , and [Cron](#) .
- In the trigger Details, enable the **Forecast** field.
- Specify the number of days for which you want scheduled tasks to display in the Forecast Calendar / Forecast List (default is 31):
  - a. From the **Administration** navigation pane, select **Configuration > Properties**. (You need administrative privileges to access this function.)
  - b. Click **Forecast Period In Days** Value column and enter the number of days you want in the forecast period.
- Enable the trigger. (Disabling the trigger removes all related entries from the Forecast calendar / Forecast list.)

## 2.8 Next Scheduled Time

For enabled Time, Temporary, and Cron triggers, the Controller calculates the next scheduled time and displays it on the Triggers list, as well as on the All Triggers and Active Triggers lists, for those trigger types.

Name ^	Description	Enabled	Next Scheduled Time	Time Style	Day Style
stonebranch-timetrigger-01		⊕	2022-11-01 13:00:00 -0400	Time	Simple
stonebranch-timetrigger-02	Run Every Two Hours During Business Hours except Holidays	⊖		Time Interval	Simple
stonebranch-timetrigger-03		⊕	2022-11-01 00:00:00 -0400	Time	Simple
stonebranch-timetrigger-04		⊖		Time	Simple
stonebranch-timetrigger-05		⊖		Time	Complex

The next scheduled time also displays in the trigger Details:

**Time Trigger Details: stonebranch-timetrigger-01**

Disable Trigger Now... List Qualifying Times...

Time Trigger Variables Instances Notes Versions

**General**

Name \* stonebranch-timetrigger-01 Version 14

Description

Member of Business Services

Calendar \* stonebranch-calendar-01 Time Zone Server (US/Eastern)

Task(s) \* stonebranch-timertask-01

Purge By Retention Duration

Forecast  Simulate -- System Default --

**Status**

Status	Next Scheduled Time
Enabled	2022-11-01 13:00:00 -0400
Enabled By	Enabled Time
Admin	2022-10-31 14:44:41 -0400

## 2.8.1 Overdue Timers

If the Controller has been stopped for a significant amount of time (more than two days), upon start-up, and under certain conditions, overdue Triggers could be ignored and disabled. If a Trigger's timer (the Trigger's [next scheduled time](#)) is considered "stale/expired," the timer will be ignored and the associated Trigger will be disabled.

If this occurs, there will be log messages similar to the following:

```
Found overdue timer exceeding restart threshold limit of 2 days. Timer overdue by: 3 Days
1 Hour 57 Minutes 52 Seconds (2016-06-27 14:15:00 -0400) **** Timer is being cancelled
*** TriggerTimerHandlerBean [...]
```

```
Disabling Trigger since stale timer was found and the next scheduled time was stale
TimeTriggerBean [...]
```

A "stale/expired" trigger is calculated based on the value of the [uc.overdue.timer.startup.threshold](#) Universal Controller start-up property (default is 2 days). If the default is specified, any enabled Trigger with a next scheduled time older than two days will be considered "stale/expired."

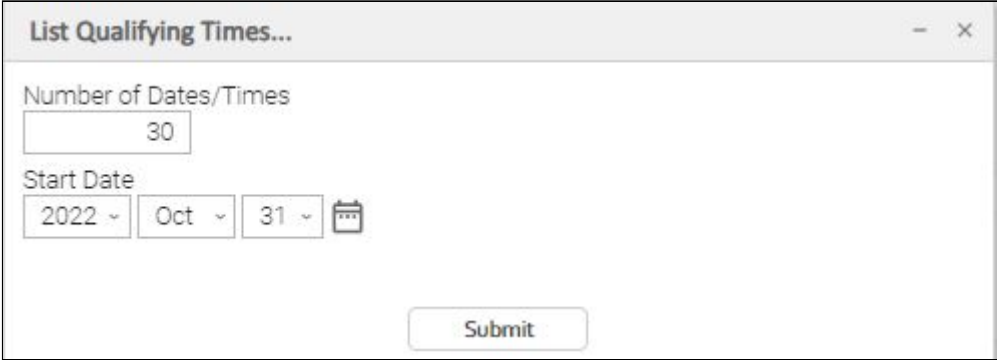
The property can be changed to a larger amount to avoid this behavior, if desired.

## 2.9 List Qualifying Times

For Time and Cron triggers, you can display a list of dates and times for when the trigger (if enabled) will be satisfied.

**Note**

This list differs from the [Forecasts list](#) , which shows scheduled task instances as opposed to qualifying times.

<p><b>Step 1</b></p>	<p>In the trigger Details for a Cron or Time trigger, click the <b>List Qualifying Times</b> button. A <b>List Qualifying Times Input</b> pop-up dialog displays.</p> 
<p><b>Step 2</b></p>	<p>In the <b>Number of Dates/Times</b> field, enter the number of dates and times that you want to be listed (default = 30, maximum = 1000).</p>
<p><b>Step 3</b></p>	<p>Enter / select a <b>Start Date</b> from when you want the list of Dates and Times to begin.</p>

**Step 4**

Click the **Submit** button to display a table of **Qualifying Dates and Times**.

stonebranch-timetrigger-01

Listing From: 2022-10-31 14:47:04 -0400 🖨️

**User/Trigger Timezone: US/Eastern**

Tue, Nov 01, 2022 13:00:00 EDT -0400
Tue, Nov 08, 2022 13:00:00 EST -0500
Tue, Nov 15, 2022 13:00:00 EST -0500
Tue, Nov 22, 2022 13:00:00 EST -0500
Tue, Nov 29, 2022 13:00:00 EST -0500
Tue, Dec 06, 2022 13:00:00 EST -0500
Tue, Dec 13, 2022 13:00:00 EST -0500
Tue, Dec 20, 2022 13:00:00 EST -0500
Tue, Dec 27, 2022 13:00:00 EST -0500
Tue, Jan 03, 2023 13:00:00 EST -0500
Tue, Jan 10, 2023 13:00:00 EST -0500
Tue, Jan 17, 2023 13:00:00 EST -0500
Tue, Jan 24, 2023 13:00:00 EST -0500
Tue, Jan 31, 2023 13:00:00 EST -0500
Tue, Feb 07, 2023 13:00:00 EST -0500
Tue, Feb 14, 2023 13:00:00 EST -0500
Tue, Feb 21, 2023 13:00:00 EST -0500
Tue, Feb 28, 2023 13:00:00 EST -0500
Tue, Mar 07, 2023 13:00:00 EST -0500
Tue, Mar 14, 2023 13:00:00 EDT -0400