

# TIBCO FOCUS<sup>®</sup>

## Release Notes

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## New Features

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The following topic provides information about new features in this release of TIBCO FOCUS®.

**In this chapter:**

- ☐ [Reporting Enhancements](#)
  - ☐ [General Enhancements](#)
  - ☐ [Output Format Enhancements](#)
  - ☐ [Adapter Enhancements](#)
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- 

### Reporting Enhancements

This topic describes enhancements that can be used for reporting.

### Full Outer Join Support

Full outer joins and right outer joins are now supported whether or not the underlying data source supports them. When the underlying data source has support for these joins, the join processing is passed to the database engine. When it does not support them, all necessary data is returned and the join processing is handled by FOCUS.

### Standard Deviation Prefix Operators: STDP. and STDS.

The standard deviation prefix operators return a numeric value that represents the amount of dispersion in the data. The set of data can be specified as the entire population (STDP.) or a sample (STDS.). The standard deviation is the square root of the variance, which is a measure of how observations deviate from their expected value (mean). If specified as a population, the divisor in the standard deviation calculation (also called degrees of freedom) will be the total number of data points, N. If specified as a sample, the divisor will be N-1.

If  $x_i$  is an observation,  $N$  is the number of observations, and  $\mu$  is the mean of all of the observations, the formula for calculating the standard deviation for a population is:

$$\sqrt{\frac{1}{N} \sum_{i=1}^N (x_i - \mu)^2}$$

To calculate the standard deviation for a sample, the mean is calculated using the sample observations, and the divisor is  $N-1$  instead of  $N$ .

**Syntax:**      **How to Calculate the Standard Deviation Using Prefix Operators**

To calculate the standard deviation for a population, the syntax is:

*STDP.field*

To calculate the standard deviation for a sample, the syntax is:

*STDS.field*

where:

*field*

Numeric

Is the set of observations for the standard deviation calculation.

**Example:**      **Calculating the Standard Deviation of a Population**

The following request calculates the standard deviation of the population of the DOLLARS field converted to double precision.

```
DEFINE FILE ibisamp/ggsales
DOLLARS/D12.2 = DOLLARS;
END
TABLE FILE ibisamp/ggsales
SUM DOLLARS STDP.DOLLARS
ON TABLE SET PAGE NOLEAD
ON TABLE SET STYLE *
GRID=OFF,$
ENDSTYLE
END
```

The output is shown in the following image.

<u>DOLLARS</u>	STDP <u>DOLLARS</u>
46,156,290.00	6,156.997845651

### **Example: Calculating the Standard Deviation of a Sample**

The following request calculates the standard deviation of a sample of the DOLLARS field converted to double precision.

```
DEFINE FILE ibisamp/ggsales
DOLLARS/D12.2 = DOLLARS;
END
TABLE FILE ibisamp/ggsales
SUM DOLLARS STDS.DOLLARS
ON TABLE SET PAGE NOLEAD
ON TABLE SET STYLE *
GRID=OFF,$
ENDSTYLE
END
```

The output is shown in the following image.

<u>DOLLARS</u>	STDS <u>DOLLARS</u>
46,156,290.00	6,157.711080272

### **Using a WHERE Phrase in a Filter on a Calculated Value**

In prior releases, specifying a WHERE phrase on a calculated value (COMPUTE field) generated an error, and processing was terminated. In the current release, a WHERE condition on a calculated field will be automatically replaced with WHERE\_GROUPED if the filter is eligible for WHERE\_GROUPED processing, or with WHERE TOTAL if it is not.

### **Navigating Joins Between Cluster Synonyms**

By default, when joining cluster synonyms, a hierarchy of segments is constructed from all of the joined files, and the resulting hierarchy is navigated in top-to-bottom, left-to-right order.

Therefore, if a left outer join is specified from a host synonym to a cluster that has an inner join, the inner join will be performed last and may remove rows from the host file, counteracting the purpose of the left outer join. Using the `SET FOCTRANSFORM = NESTED_CLUSTERS/ON` command, you can force the joins in the target cluster to be performed prior to the join between the host and target synonyms. When you use this setting, SQL scripts are used to join the tables in the target cluster prior to implementing the join to the host file. The left outer join will be performed last and will retain all rows in the host synonym.

**Note:** This feature is only supported in FOCUS for Distributed Systems.

The syntax is:

```
SET FOCTRANSFORM = {NESTED_CLUSTERS/OFF|NESTED_CLUSTERS/ON}
```

where:

NESTED\_CLUSTERS/OFF

Maintains the left-to-right, top-to-bottom order of segment navigation. This is the default value.

NESTED\_CLUSTERS/ON

Performs the joins in the target cluster synonym prior to joining the host synonym to the result.

### **Reference:** Usage Notes for Joins to Cluster Synonyms

- ❑ This feature requires that the joins be optimized. The command `SET SHORTPATH = SQL` must be in effect for combinations of inner and outer joins with the setting `FOCTRANSFORM = NESTED_CLUSTERS/OFF`, in order for the request to be optimized. The `SHORTPATH = SQL` setting has no effect on optimization with the setting `FOCTRANSFORM = NESTED_CLUSTERS/ON`.
- ❑ You cannot join to a non-root segment of a cluster synonym. If you issue a join to a non-root segment, the following message displays and the request terminates:

```
(FOC906) JOIN TO NON-ROOT SEGMENT segname IS NOT ALLOWED FOR  
NESTED_CLUSTERS
```

### **Example:** Navigating Joins Between Cluster Synonyms

This example uses SQL Server data sources generated from a file of citibike trips uploaded from <https://www.citibikenyc.com/system-data>, and from a file of zip codes for the stations used for the trips (you can download this file from [https://techsupport.informationbuilders.com/public/station\\_zip.csv](https://techsupport.informationbuilders.com/public/station_zip.csv)).



A cluster synonym named `station_trip_cls` joins the station zip data source to a data source containing partial trip data (with only a few rows). The following shows the inner join defined in the cluster synonym:

```
FILENAME=STATION_TRIP_CLS, $
  SEGMENT=STATION_ZIP_OLEDB, CRFILE=CITIBIKE/STATION_ZIP_OLEDB,
CRINCLUDE=ALL, $
  SEGMENT=CITIBIKE_PARTIAL_OLEDB, SEGTYPE=KU, PARENT=STATION_ZIP_OLEDB,
  CRFILE=CITIBIKE/CITIBIKE_PARTIAL_OLEDB, CRINCLUDE=ALL, CRJOINTYPE=INNER,
  JOIN_WHERE=STATION_ID EQ START_STATION_ID;, $
```

The following request issues a left outer join from a larger version of the trip data file to the cluster:

```
SET FOCTRANSFORM = NESTED_CLUSTERS/&VALUE
SET SHORTPATH = SQL
JOIN LEFT_OUTER START_STATION_ID IN CITIBIKE_TRIPDATA TAG T1 TO ALL
STATION_ID IN STATION_TRIP_CLS TAG T2 AS J1
TABLE FILE CITIBIKE_TRIPDATA
" NESTED_CLUSTERS/&VALUE"
" "
SUM CNT.T1.START_STATION_ID AS T1,Station CNT.ZIP_CODE
CNT.T2.START_STATION_ID AS T2,Station
ON TABLE SET PAGE NOLEAD
ON TABLE SET STYLE *
GRID=OFF,$
ENDSTYLE
END
```

Running the request with `&VALUE` set to `OFF` generates the following trace:

```
SELECT
  COUNT(T1."START_STATION_ID"),
  COUNT(T2."ZIP_CODE"),
  COUNT(T3."START_STATION_ID")
FROM
  ( ( citibike_tripdata_mssqloledb T1
  LEFT OUTER JOIN
  station_zip_oledb T2
  ON T2."STATION_ID" = T1."START_STATION_ID" )
  INNER JOIN
  citibike_partial_msoledb T3
  ON (T3."START_STATION_ID" = T2."STATION_ID") );
```

The output is shown in the following image. The inner join was done last, reducing the number of stations in the host file to the same number as in the cluster.

NESTED\_CLUSTERS/OFF

T1	ZIP_CODE	T2
<u>Station</u>	<u>COUNT</u>	<u>Station</u>
165	158	165

Running the request with &VALUE set to ON generates the following trace. Two SQL scripts are generated, one for the host file and one for the join in the cluster. Then, the left outer join is performed against the result of the inner join:

```
SELECT
  T1."START_STATION_ID" AS "SK001_START_STATION_ID",
  COUNT(T1."START_STATION_ID") AS "VB001_CNT_START_STATION_ID"
FROM
  citibike_tripdata_mssqloledb T1
GROUP BY
  T1."START_STATION_ID";
(FOC2546) SQL SCRIPT
__CITIBIKE_TRIPDATA_OLEDB_CITIBIKE_TRIPDATA_OLEDB.SQL CREATED SUCCESSFULLY
(BUT NOT EXECUTED)
_EDATEMP/___citibike_tripdata_oledb_citibike_tripdata_oledb HELD AS
SQL_SCRIPT
SELECT
  T1."STATION_ID" AS "SK001_STATION_ID",
  COUNT(T1."ZIP_CODE") AS "VB001_CNT_ZIP_CODE",
  COUNT(T2."START_STATION_ID") AS "VB002_CNT_START_STATION_ID"
FROM
  station_zip_oledb T1,
  citibike_partial_msoledb T2
WHERE
  (T2."START_STATION_ID" = T1."STATION_ID")
GROUP BY
  T1."STATION_ID";
(FOC2546) SQL SCRIPT
__CITIBIKE_TRIPDATA_OLEDB_STATION_PARTIAL_OLEDB_CLS.SQL CREATED
SUCCESSFULLY (BUT NOT EXECUTED)
_EDATEMP/___citibike_tripdata_oledb_station_partial_oledb_cls HELD AS
SQL_SCRIPT
```

```

SELECT
SUM(T1."VB001_CNT_START_STATION_ID"),
SUM(T2."VB001_CNT_ZIP_CODE"),
SUM(T2."VB002_CNT_START_STATION_ID")
FROM
(
  ( /* vvv */
    SELECT
      T1."START_STATION_ID" AS "SK001_START_STATION_ID",
      COUNT(T1."START_STATION_ID") AS
      "VB001_CNT_START_STATION_ID"
    FROM
      citibike_tripdata_mssqloledb T1
    GROUP BY
      T1."START_STATION_ID"
  ) /* ^^^ */ T1
LEFT OUTER JOIN
  ( /* vvv */
    SELECT
      T1."STATION_ID" AS "SK001_STATION_ID",
      COUNT(T1."ZIP_CODE") AS "VB001_CNT_ZIP_CODE",
      COUNT(T2."START_STATION_ID") AS
      "VB002_CNT_START_STATION_ID"
    FROM
      station_zip_oledb T1,
      citibike_partial_msoledb T2
    WHERE
      (T2."START_STATION_ID" = T1."STATION_ID")
    GROUP BY
      T1."STATION_ID"
  ) /* ^^^ */ T2
ON T2."SK001_STATION_ID" = T1."SK001_START_STATION_ID" );

```

The output is shown in the following image. The left outer join was done last, maintaining the original number of stations in the host file.

### NESTED\_CLUSTERS/ON

T1	ZIP_CODE	T2
<u>Station</u>	<u>COUNT</u>	<u>Station</u>
6680	8	9

## General Enhancements

This topic describes enhancements that can be used in multiple contexts.

Enhancements to DATE\_ORDER

The DATE\_ORDER parameter for date-time formats is now supported when the format specifies month translation, zero suppression or removal, or the comma option. For some formats with the comma option, reordering the date components may require elimination of the comma.

For example, the following request creates date fields with zero removal and suppression (YYMDoe), month translation and zero suppression (YYMte), and month translation with a comma and space between the month and year (HMTkYY). The DATE\_ORDER is set to DMY:

```
-DEFAULT &ORDER=DMY;  
SET DATE_ORDER=&ORDER  
DEFINE FILE GGSales  
ORIGINAL/YYMD=20190704;  
YYMDoe/HYYoe=DT(2019/07/04);  
YYMte/HYYMte=YYMD;  
YYMTDk/HMTkYY=YYMD;  
END  
TABLE FILE GGSales  
SUM ORIGINAL YYMDoe YYMte YYMTDk  
BY CATEGORY  
ON TABLE SET PAGE NOLEAD  
ON TABLE SET STYLE *  
GRID=OFF,$  
ENDSTYLE  
END
```

The output is shown in the following image.

<u>Category</u>	<u>ORIGINAL</u>	<u>YYMDoe</u>	<u>YYMte</u>	<u>YYMTDek</u>
Coffee	04/07/2019	4/7/2019	4 Jul 2019	July, 2019
Food	04/07/2019	4/7/2019	4 Jul 2019	July, 2019
Gifts	04/07/2019	4/7/2019	4 Jul 2019	July, 2019

International System (SI) Numeric Format Abbreviation Options

The International System standard provides numeric abbreviations for very large and very small numbers.

FOCUS supports the following SI-compliant numeric abbreviations. The SI-compliant format uses a two-character display code that consists of a lowercase *n* followed by the SI abbreviation.

Prefix	WebFOCUS Format Code	Size	Example	English Name (American/British)
yotta	nY	10**24	1000000000000000000000000	septillion/quadrillion
zetta	nZ	10**21	100000000000000000000000	sextillion/trilliard
exa	nE	10**18	100000000000000000000000	quintillion/trillion
peta	nP	10**15	100000000000000000000000	quadrillion/billiard
tera	nT	10**12	100000000000000000000000	trillion/billion
giga	nG	10**9	10000000000	billion/milliard
mega	nM	10**6	1000000	million
kilo	nK	10**3	1000	thousand
milli	nm	10**(-3)	0.001	thousandth
micro	nu	10**(-6)	0.000001	millionth
nano	nn	10**(-9)	0.000000001	billionth/milliardth
pico	np	10**(-12)	0.0000000000001	trillionth/billionth
femto	nf	10**(-15)	0.000000000000001	quadrillionth/billiardth
atto	na	10**(-18)	0.0000000000000000001	quintillionth/trillionth
zepto	nz	10**(-21)	0.000000000000000000001	sextillionth/trilliardth
yocto	ny	10**(-24)	0.00000000000000000000001	septillionth/quadrillionth

The following request uses the mega and giga format options. The decimal precision is controlled by the format which, in this case, is a reformat specified in the SUM command.

```
DEFINE FILE GGSales
NEWDOll/D12.2 = DOLLARS * 100;
END
TABLE FILE GGSales
SUM DOLLARS NEWDOll/D12.5nM AS Millions NEWDOll/D12.3nG AS Billions
BY CATEGORY
ON TABLE SET PAGE NOLEAD
ON TABLE SET STYLE *
GRID=OFF,$
ENDSTYLE
END
```

The output is shown in the following image.

<u>Category</u>	<u>Dollar Sales</u>	<u>Millions</u>	<u>Billions</u>
Coffee	17231455	1,723.14550M	1.723G
Food	17229333	1,722.93330M	1.723G
Gifts	11695502	1,169.55020M	1.170G

## New Regular Expression Pattern Matching Functions

The following FOCUS and SQL functions search for strings that match a pattern expressed as a regular expression.

- ☐ **REGEXP\_COUNT.** Counts the number of matches to a regular expression pattern in a string.
- ☐ **REGEXP\_INSTR.** Returns the first position of a regular expression pattern in a string.
- ☐ **REGEXP\_REPLACE.** Replaces all matches to a regular expression pattern in a string with a replacement string.
- ☐ **REGEXP\_SUBSTR.** Returns the first match to a regular expression pattern in a string.

You can search online for information about the symbols used to create a regular expression pattern. For example, Wikipedia has a good introduction at:

[https://en.wikipedia.org/wiki/Regular\\_expression](https://en.wikipedia.org/wiki/Regular_expression)

### REGEXP\_COUNT: Counting the Number of Matches to a Pattern in a String

REGEXP\_COUNT returns the integer count of matches to a specified regular expression pattern within a source string.

**Syntax:**      **How to Count the Number of Matches to a Pattern in a String**

```
REGEXP_COUNT(string, pattern)
```

where:

*string*

Alphanumeric

Is the input string to be searched.

*pattern*

Alphanumeric

Is the regular expression pattern to match.

**Example:**      **Counting the Number of Matches to a Pattern in a String**

The following examples use the following Regular Expression symbols.

❑ \$, which searches for a specified expression that occurs at the end of a string.

❑ ^, which searches for a specified expression that occurs at the beginning of a string.

REGEXP\_COUNT counts the number of occurrences of the characters 'umpty' that occur at the end of the string 'Humpty Dumpty'.

```
REGEXP_COUNT('Humpty Dumpty', 'umpty$')
```

The result is 1.

REGEXP\_COUNT counts the number of occurrences of the characters 'umpty' that occur at the beginning of the string 'Humpty Dumpty'.

```
REGEXP_COUNT('Humpty Dumpty', '^umpty')
```

The result is 0.

**REGEXP\_INSTR: Returning the First Position of a Pattern in a String**

REGEXP\_INSTR returns the integer position of the first match to a specified regular expression pattern within a source string. The first character position in a string is indicated by the value 1. If there is no match within the source string, the value 0 is returned.

**Syntax:**      **How to Return the Position of a Pattern in a String**

```
REGEXP_INSTR(string, pattern)
```

where:

*string*

Alphanumeric

Is the input string to be searched.

*pattern*

Alphanumeric

Is the regular expression pattern to match.

### **Example:** Finding the Position of a Pattern in a String

The following examples use the following Regular Expression symbols.

❑ \$, which searches for a specified expression that occurs at the end of a string.

❑ ^, which searches for a specified expression that occurs at the beginning of a string.

REGEXP\_INSTR finds the position of the characters 'umpty' that occur at the end of the string 'Humpty Dumpty'.

```
REGEXP_INSTR('Humpty Dumpty', 'umpty$')
```

The result is 9.

REGEXP\_INSTR finds the position of the characters 'umpty' that occur at the beginning of the string 'Humpty Dumpty'.

```
REGEXP_INSTR('Humpty Dumpty', '^umpty')
```

The result is 0.

### **REGEXP\_REPLACE: Replacing All Matches to a Pattern in a String**

REGEXP\_REPLACE returns a string generated by replacing all matches to a regular expression pattern in the source string with the given replacement string. The replacement string can be a null string.

### **Syntax:** How to Replace Matches to a Pattern in a String

```
REGEXP_REPLACE(string, pattern, replacement)
```

where:

*string*

Alphanumeric

Is the input string to be searched.



*pattern*

Alphanumeric

Is the regular expression pattern to match.

*replacement*

Alphanumeric

Is the replacement string.

**Example: Replacing Matches to a Pattern in a String**

The following example uses the following Regular Expression symbol.

❑ ^, which searches for a specified expression that occurs at the beginning of a string.

REGEXP\_REPLACE replaces the characters 'ENG' at the beginning of the field COUNTRY with the replacement string 'SCOT'.

```
REGEXP_REPLACE(COUNTRY, '^ENG', 'SCOT')
```

For 'ENGLAND', the result is 'SCOTLAND'.

**REGEXP\_SUBSTR: Returning the First Match to a Pattern in a String**

REGEXP\_SUBSTR returns a string that contains the first match to a specified regular expression pattern within a source string. If there is no match within the source string, a null string is returned.

**Syntax: How to Returning the First Match to a Pattern in a String**

```
REGEXP_SUBSTR(string, pattern)
```

where:

*string*

Alphanumeric

Is the input string to be searched.

*pattern*

Alphanumeric

Is the regular expression pattern to match.

**Example: Returning the First Match of a Pattern in a String**

The following example uses the following Regular Expression symbols.

❑ `[A-Z]`, which matches any uppercase letter.

❑ `$`, which searches for a specified expression that occurs at the end of a string.

`REGEXP_SUBSTR` searches for a string with any uppercase letter followed by the characters 'umpty' at the end of the string 'Humpty Dumpty'.

```
REGEXP_SUBSTR('Humpty Dumpty', '[A-Z]umpty$')
```

The result is 'Dumpty'.

**New Functions for Date-time Conversion Between Local and UTC Time**

Coordinated Universal Time (UTC) is the time standard commonly used around the world. To convert UTC time to a local time, a certain number of hours must be added to or subtracted from the UTC time, depending on the number of time zones between the locality and Greenwich, England (GMT).

The following functions convert date-time values between UTC time and local time.

❑ **DT\_TOUTC.** Converts local time to UTC time.

❑ **DT\_TOLOCAL.** Converts UTC time to local time.

Converting timestamp values from different localities to a common standard time enables you to sort events into the actual event sequence.

These functions require IANA (Internet Assigned Numbers Authority) time zone database names (expressed as 'Area/Location') as parameters. You can find a table of IANA TZ database names on Wikipedia at [https://en.wikipedia.org/wiki/List\\_of\\_tz\\_database\\_time\\_zones](https://en.wikipedia.org/wiki/List_of_tz_database_time_zones), as shown in the following image.

**Legend** [\[ edit \]](#)

UTC offsets (columns 6 and 7) are positive east of UTC and negative west of UTC. The *UTC DST offset* is different from the *UTC offset* for zones where *daylight saving time* is observed (see individual time zone pages for details). The UTC offsets are for the current or upcoming rules, and may have been different in the past.

The "Status" field means:

- Canonical - The primary, preferred zone name.
- Alias - An alternative name, which may fit better within a particular country.
- Deprecated - An older style name, left in the tz database for backwards compatibility, which should generally not be used.

**List** [\[ edit \]](#)

Country code	Latitude, longitude ±DDMM(SS) ±DDMM(SS)	TZ database name	Portion of country covered	Status	UTC offset ±hh:mm	UTC DST offset ±hh:mm	Notes
CI	+0519-00402	Africa/Abidjan		Canonical	+00:00	+00:00	
GH	+0533-00013	Africa/Accra		Canonical	+00:00	+00:00	
ET	+0902+03942	Africa/Addis_Ababa		Alias	+03:00	+03:00	Link to Africa/Nairobi
DZ	+3647+00303	Africa/Algiers		Canonical	+01:00	+01:00	
ER	+1520+03853	Africa/Asmara		Alias	+03:00	+03:00	Link to Africa/Nairobi
ML	+1239-00800	Africa/Bamako		Alias	+00:00	+00:00	Link to Africa/Abidjan
CF	+0422+01835	Africa/Bangui		Alias	+01:00	+01:00	Link to Africa/Lagos
GM	+1328-01639	Africa/Banjul		Alias	+00:00	+00:00	Link to Africa/Abidjan
GW	+1151-01535	Africa/Bissau		Canonical	+00:00	+00:00	
MW	-1547+03500	Africa/Blantyre		Alias	+02:00	+02:00	Link to Africa/Maputo
CG	-0416+01517	Africa/Brazzaville		Alias	+01:00	+01:00	Link to Africa/Lagos
BI	-0323+02922	Africa/Bujumbura		Alias	+02:00	+02:00	Link to Africa/Maputo
EG	+3003+03115	Africa/Cairo		Canonical	+02:00	+02:00	

If you do not know what Area and Location corresponds to your time zone, but you do know your offset from GMT, or your legacy time zone name (such as EST), scroll down in the table. There are TZ database names that correspond to these time zone identifiers, as shown in the following image.

	EST	Deprecated	-05:00	-05:00	Choose a zone that currently observes EST without daylight saving time, such as <a href="#">America/Cancun</a> .
	EST5EDT	Deprecated	-05:00	-04:00	Choose a zone that observes EST with United States daylight saving time rules, such as <a href="#">America/New_York</a> .
	Etc/GMT	Canonical	+00:00	+00:00	
	Etc/GMT+0	Alias	+00:00	+00:00	Link to Etc/GMT
	Etc/GMT+1	Canonical	-01:00	-01:00	Sign is intentionally inverted. See the <a href="#">Etc area description</a> .
	Etc/GMT+10	Canonical	-10:00	-10:00	Sign is intentionally inverted. See the <a href="#">Etc area description</a> .
	Etc/GMT+11	Canonical	-11:00	-11:00	Sign is intentionally inverted. See the <a href="#">Etc area description</a> .
	Etc/GMT+12	Canonical	-12:00	-12:00	Sign is intentionally inverted. See the <a href="#">Etc area description</a> .
	Etc/GMT+2	Canonical	-02:00	-02:00	Sign is intentionally inverted. See the <a href="#">Etc area description</a> .
	Etc/GMT+3	Canonical	-03:00	-03:00	Sign is intentionally inverted. See the <a href="#">Etc area description</a> .
	Etc/GMT+4	Canonical	-04:00	-04:00	Sign is intentionally inverted. See the <a href="#">Etc area description</a> .
	Etc/GMT+5	Canonical	-05:00	-05:00	Sign is intentionally inverted. See the <a href="#">Etc area description</a> .

**Note:** If you use a standard IANA time zone database name in the form "Area/Location" (for example, "America/New\_York"), automatic adjustments are made for Daylight Savings Time. If you use a name that corresponds to an offset from GMT or to a legacy time zone name, it is your responsibility to account for Daylight Savings Time.

### DT\_TOUTC: Converting Local Time to UTC Time

DT\_TOUTC takes a local date-time value and an IANA time zone name and converts the local time to UTC time.

#### **Syntax:** How to Convert Local Time to UTC Time

`DT_TOUTC(datetime, timezone)`

where:

*datetime*

Date-time

Is a date-time expression representing local time, containing date and time components.

*timezone*

Alphanumeric

Is a character expression containing the IANA time zone name of the local time, in the form 'Area/Location' (for example, 'America/New\_York').

#### **Example:** Converting Local Time to UTC Time

The following request converts the current local date-time value for time zone America/New\_York to UTC time.

```
TABLE FILE GGSales
SUM DOLLARS NOPRINT
COMPUTE LOCAL1/HYYMDS = DT_CURRENT_DATETIME(SECOND);
COMPUTE UTC1/HYYMDS = DT_TOUTC(LOCAL1, 'America/New_York');
ON TABLE SET PAGE NOLEAD
ON TABLE SET STYLE *
GRID=OFF,$
ENDSTYLE
END
```

The output is shown in the following image.

<u>LOCAL1</u>	<u>UTC1</u>
2020/09/04 14:49:41	2020/09/04 18:49:41

**Example:   Sorting by UTC Time**

The following request retrieves the current date and time into the field LOCALT1 and sets the field TIMEZONE to IANA time zone database names. It then uses DT\_TOUTC to convert the same local time, with different time zones, to the UTC time that corresponds to the given time zone, and sorts the output by the generated UTC time.

```

DEFINE FILE GGSales
LOCALT1/HYYMDS=DT_CURRENT_DATETIME(SECOND);
TIMEZONE/A30=IF LAST TIMEZONE EQ ' ' THEN 'AMERICA/NEW_YORK'
ELSE IF LAST TIMEZONE EQ 'AMERICA/NEW_YORK' THEN 'AMERICA/CHICAGO'
ELSE IF LAST TIMEZONE EQ 'AMERICA/CHICAGO' THEN 'AMERICA/DENVER'
ELSE IF LAST TIMEZONE EQ 'AMERICA/DENVER' THEN 'ASIA/TOKYO'
ELSE IF LAST TIMEZONE EQ 'ASIA/TOKYO' THEN 'EUROPE/LONDON'
ELSE IF LAST TIMEZONE EQ 'EUROPE/LONDON' THEN 'AMERICA/NEW_YORK';
UTCTIME/HYYMDS=DT_TOUTC(LOCALT1, TIMEZONE) ;
END
TABLE FILE GGSales
PRINT TIMEZONE LOCALT1 DOLLARS NOPRINT
BY UTCTIME
WHERE PRODUCT EQ 'Thermos'
IF RECORDLIMIT EQ 20
ON TABLE SET PAGE NOLEAD
ON TABLE SET STYLE *
GRID=OFF,$
ENDSTYLE
END

```

The output is shown in the following image.

<u>UTCTIME</u>	<u>TIMEZONE</u>	<u>LOCALTIME</u>
2020/10/02 06:45:59	ASIA/TOKYO	2020/10/02 15:45:59
	ASIA/TOKYO	2020/10/02 15:45:59
	ASIA/TOKYO	2020/10/02 15:45:59
	ASIA/TOKYO	2020/10/02 15:45:59
2020/10/02 14:45:59	EUROPE/LONDON	2020/10/02 15:45:59
	EUROPE/LONDON	2020/10/02 15:45:59
	EUROPE/LONDON	2020/10/02 15:45:59
	EUROPE/LONDON	2020/10/02 15:45:59
2020/10/02 19:45:59	AMERICA/NEW_YORK	2020/10/02 15:45:59
	AMERICA/NEW_YORK	2020/10/02 15:45:59
	AMERICA/NEW_YORK	2020/10/02 15:45:59
	AMERICA/NEW_YORK	2020/10/02 15:45:59
2020/10/02 20:45:59	AMERICA/CHICAGO	2020/10/02 15:45:59
	AMERICA/CHICAGO	2020/10/02 15:45:59
	AMERICA/CHICAGO	2020/10/02 15:45:59
	AMERICA/CHICAGO	2020/10/02 15:45:59
2020/10/02 21:45:59	AMERICA/DENVER	2020/10/02 15:45:59
	AMERICA/DENVER	2020/10/02 15:45:59
	AMERICA/DENVER	2020/10/02 15:45:59
	AMERICA/DENVER	2020/10/02 15:45:59

**DT\_TOLOCAL: Converting UTC Time to Local Time**

DT\_TOLOCAL takes a UTC date-time value and an IANA time zone name and converts the UTC time to local time.

**Syntax: How to Convert UTC Time to Local Time**

`DT_TOLOCAL(datetime, timezone)`

where:

*datetime*

Date-time

Is a date-time expression representing UTC time, containing date and time components.

*timezone*

Alphanumeric

Is a character expression containing the IANA time zone name of the local time, in the form 'Area/Location' (for example, 'America/New\_York').

**Example: Converting UTC Time to Local Time**

The following request converts the current date-time value from UTC time to local time for time zone America/New\_York.

```
TABLE FILE GGSales
SUM DOLLARS NOPRINT
COMPUTE UTC1/HYMDS = DT_CURRENT_DATETIME(SECOND);
COMPUTE LOCAL1/HYMDS = DT_TOLOCAL(UTC1, 'America/New_York');
ON TABLE SET PAGE NOLEAD
ON TABLE SET STYLE *
GRID=OFF,$
ENDSTYLE
END
```

The output is shown in the following image.

<u>UTC1</u>	<u>LOCAL1</u>
2020/09/04 15:00:26	2020/09/04 11:00:26

**Support for Functions Used in ODBC Connector Client Tools**

FOCUS and the SQL translator now support the following functions used by client tools with the ODBC Connector.

**FOCUS and SQL Functions**

Function Name	Description	Syntax
ASCII	Returns the ASCII code value of the leftmost character of a character expression.	<p><i>ASCII(charexp)</i></p> <p>For example, the following returns the value 65.</p> <p><i>ASCII('A')</i></p>

Function Name	Description	Syntax
DAYNAME	Returns a character string that contains the data-source-specific name of the day for the day part of a date expression.	<code>DAYNAME(<i>date_exp</i>)</code>  For example, the following returns Monday:  <code>DAYNAME('August 3, 2020')</code>
DIFFERENCE	Returns an integer value measuring the difference between the SOUNDEX or METAPHONE values of two different character expressions. Zero (0) represents the least similarity. For SOUNDEX, 4 represents the most similarity, and for METAPHONE, 16 represents the most similarity.  The use of SOUNDEX or METAPHONE depends on the PHONETIC_ALGORITHM setting. METAPHONE is the default algorithm.	<code>DIFFERENCE(<i>chrexpl</i>, <i>chrexpl2</i>)</code>  For example, the following returns the value 4 when SOUNDEX is the phonetic algorithm:  <code>DIFFERENCE('Green', 'Greene')</code>
LEFT	Given a character string, or an expression that can be converted to varchar, and an integer number, returns that number of characters from the left of the string.	<code>LEFT(<i>chr_exp</i>, <i>int_exp</i>)</code>  For example, the following returns the value <i>ab</i> :  <code>LEFT('abcdefg', 2)</code>
LOG10	Returns the base-10 logarithm of a numeric expression.	<code>LOG10(<i>num_exp</i>)</code>  For example, the following returns the value 2.161:  <code>LOG10(145)</code>



Function Name	Description	Syntax
MONTHNAME	Returns a character string that contains the data-source-specific name of the month for the month part of a date expression.	<p><code>MONTHNAME(<i>date_exp</i>)</code></p> <p>For example, the following returns August:</p> <p><code>MONTHNAME('August 3, 2020')</code></p>
OVERLAY	Given a starting position, length, source string, and insertion string, replaces the number of characters defined by <i>length</i> in the source string with the insertion string, starting from the starting position.	<p><code>OVERLAY(<i>src, ins, start, len</i>)</code></p> <p>For example, the following returns SCOTLAND by replacing the first 3 characters in ENGLAND with the characters SCOT:</p> <p><code>OVERLAY('ENGLAND', 'SCOT', 1, 3)</code></p>
POSITION	Given a search string, a source string, and a starting position, returns the position of the search string within the source string. The search starts at the given starting position. If the string is not found, returns zero (0). The search is case sensitive.	<p><code>POSITION(<i>search, source, start</i>)</code></p> <p>For example, when CustomerName is Sandra Arzola, the following returns 8:</p> <p><code>POSITION('A', CustomerName, 3)</code></p>
REPEAT	Given a source string and an integer number, returns a string with the source string repeated that number of times, each repetition separated from the previous one with a space.	<p><code>REPEAT(<i>source_str, number</i>)</code></p> <p>For example, when FIRST_NAME is MARY, the following returns the string MARY MARY MARY:</p> <p><code>REPEAT(FIRST_NAME, 3)</code></p>
RIGHT	Given a character string, or an expression that can be converted to varchar, and an integer number, returns that number of characters from the right of the string.	<p><code>RIGHT(<i>char_exp, integer_exp</i>)</code></p> <p>For example, the following returns the value fg:</p> <p><code>RIGHT('abcdefg', 2)</code></p>

Function Name	Description	Syntax
ROUND	Given a numeric expression and an integer count, returns the numeric expression rounded to that number of decimal places. If the number of decimal places is negative, it rounds to the left of the decimal point.	<code>ROUND(<i>num_exp</i>, <i>count</i>)</code>  For example, the following returns 1.23500.  <code>ROUND(1.23456, 3)</code>
SIGN	Given a numeric expression, returns the value 1 if it is positive, or -1 if it is negative. SIGN(0) returns 0.	<code>SIGN(<i>num_exp</i>)</code>  For example, the following returns 1.  <code>SIGN(1.23456)</code>
SPACE	Given an integer count, returns a string consisting of that number of spaces.	<code>SPACE(<i>count</i>)</code>  For example, the following returns a string consisting of two spaces.  <code>SPACE(2)</code>
TRUNCATE	Truncates a numeric expression to a given number of decimal places. If the number of decimal places is negative, the number is truncated to the left of the decimal point.	<code>TRUNCATE(<i>num_exp</i>, <i>count</i>)</code>  For example, the following returns 1.23400.  <code>TRUNCATE(1.23456, 3)</code>

### SQL Functions

Function Name	Description	Syntax
CHR	Takes a number as an argument and returns the ASCII character.	<code>CHR(<i>number</i>)</code>  For example, the following returns ¾.  <code>CHR(190)</code>

Function Name	Description	Syntax
LOCATE	Given a substring, a source string and a starting position (the default is 1), returns the position of the first occurrence of the substring, starting the search at the starting position. If the substring is not found, returns zero (0). The search is case insensitive.	<code>LOCATE(<i>substr</i>, <i>source</i> [, <i>start</i>])</code>  For example, when CustomerName is Sandra Arzola, the following returns 6:  <code>LOCATE('a', CustomerName, 3)</code>  The following returns 2:  <code>LOCATE('a', CustomerName)</code>

## IMPUTE: Replacing Missing Values With Aggregated Values

IMPUTE calculates a value to replace missing numeric data on report output, within a partition.

In place of eliminating data records with missing values from analysis, IMPUTE enables you to substitute a variety of estimates for the missing values, including the mean, the median, the mode, or a numeric constant, all calculated within the data partition specified by the reset key. This function is designed to be used with detail level reports (PRINT or LIST commands), and with calculated values (fields created with the COMPUTE command).

The syntax is:

```
IMPUTE(field, reset_key, replacement)
```

where:

*field*

Is the name of the numeric input field that is defined with MISSING ON.

*reset\_key*

Defines the partition for the calculation. Valid values are:

- ☐ A sort field name.
- ☐ PRESET, which uses the break defined by the SET PARTITION\_ON command.
- ☐ TABLE, which performs the calculation on the entire table.

*replacement*

Is a numeric constant or one of the following:

- ☐ MEAN
- ☐ MEDIAN
- ☐ MODE

**Example: Replacing Missing Values With Aggregated Values**

To run this example, the FOCUS data source SALEMISS must be created. SALEMISS is the SALES data source with some missing values added in the RETURNS and DAMAGED fields. The following is the SALEMISS Master File, which should be added to the IBISAMP application.

```
FILENAME=KSALES, SUFFIX=FOC, REMARKS='Legacy Metadata Sample: sales', $

SEGNAME=STOR_SEG, SEGTYPE=S1,
  FIELDNAME=STORE_CODE, ALIAS=SNO, FORMAT=A3, $
  FIELDNAME=CITY, ALIAS=CTY, FORMAT=A15, $
  FIELDNAME=AREA, ALIAS=LOC, FORMAT=A1, $

SEGNAME=DATE_SEG, PARENT=STOR_SEG, SEGTYPE=SH1,
  FIELDNAME=DATE, ALIAS=DTE, FORMAT=A4MD, $

SEGNAME=PRODUCT, PARENT=DATE_SEG, SEGTYPE=S1,
  FIELDNAME=PROD_CODE, ALIAS=PCODE, FORMAT=A3, FIELDTYPE=I, $
  FIELDNAME=UNIT_SOLD, ALIAS=SOLD, FORMAT=I5, $
  FIELDNAME=RETAIL_PRICE, ALIAS=RP, FORMAT=D5.2M, $
  FIELDNAME=DELIVER_AMT, ALIAS=SHIP, FORMAT=I5, $
  FIELDNAME=OPENING_AMT, ALIAS=INV, FORMAT=I5, $
  FIELDNAME=RETURNS, ALIAS=RTN, FORMAT=I3, MISSING=ON, $
  FIELDNAME=DAMAGED, ALIAS=BAD, FORMAT=I3, MISSING=ON, $
```

The following procedure creates the SALEMISS data source and then adds the missing values to the RETURNS and DAMAGED fields:

```
CREATE FILE ibisamp/SALEMISS
MODIFY FILE ibisamp/SALEMISS
FIXFORM STORE_CODE/3 CITY/15 AREA/1 DATE/4 PROD_CODE/3
FIXFORM UNIT_SOLD/5 RETAIL_PRICE/5 DELIVER_AMT/5
FIXFORM OPENING_AMT/5 RETURNS/3 DAMAGED/3
MATCH STORE_CODE
ON NOMATCH INCLUDE
ON MATCH CONTINUE
MATCH DATE
ON NOMATCH INCLUDE
ON MATCH CONTINUE
MATCH PROD_CODE
ON NOMATCH INCLUDE
ON MATCH REJECT
DATA
14BSTAMFORD      S1212B10    60  .95    80   65 10  6
14BSTAMFORD      S1212B12    40 1.29    20   50  3  3
14BSTAMFORD      S1212B17    29 1.89    30   30  2  1
14BSTAMFORD      S1212C13    25 1.99    30   40  3  0
14BSTAMFORD      S1212C7     45 2.39    50   49  5  4
14BSTAMFORD      S1212D12    27 2.19    40   35  0  0
14BSTAMFORD      S1212E2     80  .99   100  100  9  4
14BSTAMFORD      S1212E3     70 1.09    80   90  8  9
14ZNEW YORK      U1017B10    30  .85    30   10  2  3
14ZNEW YORK      U1017B17    20 1.89    40   25  2  1
14ZNEW YORK      U1017B20    15 1.99    30    5  0  1
14ZNEW YORK      U1017C17    12 2.09    10   15  0  0
14ZNEW YORK      U1017D12    20 2.09    30   10  3  2
14ZNEW YORK      U1017E1     30  .89    25   45  4  7
14ZNEW YORK      U1017E3     35 1.09    25   45  4  2
77FUNIONDALE     R1018B20    25 2.09    40   25  1  1
77FUNIONDALE     R1018C7     40 2.49    40   40  0  0
K1 NEWARK        U1019B12    29 1.49    30   30  1  0
K1 NEWARK        U1018B10    13  .99    30   15  1  1
END
-RUN
```

```
MODIFY FILE ibisamp/SALEMISS
FIXFORM STORE_CODE/3 DATE/5 PROD_CODE/4
FIXFORM UNIT/3 RETAIL/5 DELIVER/3
FIXFORM OPEN/3 RETURNS/C3 DAMAGED/C3
MATCH STORE_CODE
ON NOMATCH INCLUDE
ON MATCH CONTINUE
MATCH DATE
ON NOMATCH INCLUDE
ON MATCH CONTINUE
MATCH PROD_CODE
ON NOMATCH INCLUDE
ON MATCH REJECT
DATA
14Z1017 C13 15 1.99 35 30      6
14Z1017 C14 18 2.05 30 25 4
14Z1017 E2  33 0.99 45 40
END
-RUN
```

The following request against the SALEMISS data source generates replacement values for the missing values in the RETURNS field, using only the values within the same store.

```
SET PARTITION_ON=FIRST
TABLE FILE SALEMISS
PRINT RETURNS
COMPUTE MEDIAN1 = IMPUTE(RETURNS, PRESET, MEDIAN);
COMPUTE MEAN1 = IMPUTE(RETURNS, PRESET, MEAN);
COMPUTE MODE1 = IMPUTE(RETURNS, PRESET, MODE);
BY STORE_CODE
ON TABLE SET PAGE NOPAGE
ON TABLE SET STYLE *
TYPE=REPORT, GRID=OFF,$
ENDSTYLE
END
```

The output is shown in the following image. The missing values occur in store 14Z, and the replacement values are calculated using only the RETURNS values from that store because PARTITION\_ON is set to FIRST.

<u>STORE_CODE</u>	<u>RETURNS</u>	<u>MEDIAN1</u>	<u>MEAN1</u>	<u>MODE1</u>
14B	10	10.00	10.00	10.00
	3	3.00	3.00	3.00
	2	2.00	2.00	2.00
	3	3.00	3.00	3.00
	5	5.00	5.00	5.00
	0	.00	.00	.00
	9	9.00	9.00	9.00
	8	8.00	8.00	8.00
	2	2.00	2.00	2.00
14Z	2	2.00	2.00	2.00
	0	.00	.00	.00
	.	2.00	2.00	4.00
	4	4.00	4.00	4.00
	0	.00	.00	.00
	3	3.00	3.00	3.00
	4	4.00	4.00	4.00
	.	2.00	2.00	4.00
	4	4.00	4.00	4.00
	1	1.00	1.00	1.00
77F	0	.00	.00	.00
	1	1.00	1.00	1.00
K1	1	1.00	1.00	1.00
	1	1.00	1.00	1.00

Changing the PARTITION\_ON setting to TABLE produces the following output, in which the replacement values are calculated using all of the rows in the table.

<u>STORE_CODE</u>	<u>RETURNS</u>	<u>MEDIAN1</u>	<u>MEAN1</u>	<u>MODE1</u>
14B	10	10.00	10.00	10.00
	3	3.00	3.00	3.00
	2	2.00	2.00	2.00
	3	3.00	3.00	3.00
	5	5.00	5.00	5.00
	0	.00	.00	.00
	9	9.00	9.00	9.00
	8	8.00	8.00	8.00
	2	2.00	2.00	2.00
14Z	2	2.00	2.00	2.00
	0	.00	.00	.00
	.	2.00	3.00	.00
	4	4.00	4.00	4.00
	0	.00	.00	.00
	3	3.00	3.00	3.00
	4	4.00	4.00	4.00
	.	2.00	3.00	.00
	4	4.00	4.00	4.00
77F	1	1.00	1.00	1.00
	0	.00	.00	.00
	1	1.00	1.00	1.00
K1	1	1.00	1.00	1.00
	1	1.00	1.00	1.00



## OUTLIER: Identifying Outliers in Numeric Data

The  $1.5 * \text{IQR}$  rule (where IQR means Inner Quartile Range) is a common way to identify outliers in data. This rule defines an outlier as a value that is above or below 1.5 times the inner quartile range in the data. The inner quartile range is based on sorting the data values, dividing it into equal quarters, and calculating the range of values between the first quartile (the value one quarter of the way through the sorted data) and third quartile (the value three quarters of the way through the sorted data). The value that is 1.5 times below the inner quartile range is called the *lower fence*, and the value that is 1.5 times above the inner quartile range is called the *upper fence*.

Given a numeric field as input, OUTLIER returns one of the following values for each value of the field, using the  $1.5 * \text{IQR}$  rule:

- ❑ **0 (zero).** The value is not an outlier.
- ❑ **-1.** The value is below the lower fence.
- ❑ **1.** The value is above the upper fence.

### **Syntax:** How to Identify Outliers in Numeric Data

```
OUTLIER(input_field)
```

where:

*input\_field*

Numeric

Is the numeric field to be analyzed.

**Example: Identifying Outliers**

The following request defines the SALES field to have different values depending on the store code, and uses OUTLIER to determine whether each field value is an outlier.

```

DEFINE FILE GGSales
SALES/D12 = IF ((CATEGORY EQ 'Coffee') AND (STCD EQ 'R1019')) THEN 19000
             ELSE IF ((CATEGORY EQ 'Coffee') AND (STCD EQ 'R1020')) THEN 20000
             ELSE IF ((CATEGORY EQ 'Coffee') AND (STCD EQ 'R1040')) THEN 7000
             ELSE DOLLARS;
END
TABLE FILE GGSales
SUM SALES
COMPUTE OUT1/I3 = OUTLIER(SALES);
BY CATEGORY
BY STCD
WHERE CATEGORY EQ 'Coffee'
ON TABLE SET PAGE NOLEAD
ON TABLE SET STYLE *
GRID=OFF,$
ENDSTYLE
END

```

The output is shown in the following image. Values above 2 million are above the upper fence, values below 1 million are below the lower fence, and other values are not outliers:

<u>Category</u>	<u>Store ID</u>	<u>SALES</u>	<u>OUT1</u>
Coffee	R1019	2,280,000	1
	R1020	2,400,000	1
	R1040	840,000	-1
	R1041	1,576,915	0
	R1044	1,340,437	0
	R1088	1,375,040	0
	R1100	1,364,420	0
	R1109	1,459,160	0
	R1200	1,463,453	0
	R1244	1,553,962	0
	R1248	1,535,631	0
	R1250	1,386,124	0

## Enhancement to the PARTITION\_AGGR Function

The post-aggregation calculations MEDIAN and MODE have been added to the PARTITION\_AGGR function.

## Support for Standard Deviation in PARTITION\_AGGR

The PARTITION\_AGGR function generates rolling calculations based on a block of rows from the internal matrix of a TABLE request. Population Standard Deviation (STDP) and Sample Standard Deviation (STDS) have been added as operations for the rolling calculation.

**Note:** Using the STDS or STDP aggregation operators requires that the request use the PRINT display command to avoid duplicate aggregation steps.

The syntax is:

```
PARTITION_AGGR([prefix.]measure,reset_key,lower,upper,operation)
```

where:

*prefix.*

Defines an aggregation operator to apply to the measure before using it in the rolling calculation. Valid operators are:

- ☐ **SUM.** which calculates the sum of the measure field values. SUM is the default operator.
- ☐ **CNT.** which calculates a count of the measure field values.
- ☐ **AVE.** which calculates the average of the measure field values.
- ☐ **MIN.** which calculates the minimum of the measure field values.
- ☐ **MAX.** which calculates the maximum of the measure field values.
- ☐ **FST.** which retrieves the first value of the measure field.
- ☐ **LST.** which retrieves the last value of the measure field.
- ☐ **STDP.** which retrieves the population standard deviation of the measure field.
- ☐ **STDS.** which retrieves the sample standard deviation of the measure field.

**Note:** The operators PCT., RPCT., TOT., MDN., and DST. are not supported. COMPUTES that reference those unsupported operators are also not supported.

### *measure*

Is the measure field to be aggregated. It can be a real field in the request or a calculated value generated with the COMPUTE command, as long as the COMPUTE does not reference an unsupported prefix operator.

### *reset\_key*

Identifies the point at which the calculation restarts. Valid values are:

- ☐ The name of a sort field in the request.
- ☐ PRESET, which uses the value of the PARTITION\_ON parameter, as described in the *Using Functions* manual.
- ☐ TABLE, which indicates that there is no break on a sort field.

The sort field may use BY HIGHEST to indicate a HIGH-TO-LOW sort. ACROSS COLUMNS AND is supported. BY ROWS OVER and FOR are not supported.

### *lower*

Identifies the starting point for the rolling calculation. Valid values are:

- ☐ **n, -n**, which starts the calculation *n* rows forward or back from the current row.
- ☐ **B**, which starts the calculation at the beginning of the current sort break (the first line with the same sort field value as the current line).

### *upper*

Identifies the ending point of the rolling calculation. The *lower* row value must precede *upper* row value.

Valid values are:

- ☐ **C**, which ends the rolling calculation at the current row in the internal matrix.
- ☐ **n, -n**, which ends the calculation *n* rows forward or back from the current row.
- ☐ **E**, which ends the rolling calculation at the end of the sort break (the last line with the same sort value as the current row.)

**Note:** The values used in the calculations depend on the sort sequence (ascending or descending) specified in the request. Be aware that displaying a date or time dimension in descending order may produce different results than those you may expect.

*operation*

Specifies the rolling calculation used on the values in the internal matrix. The new supported operations are:

- ❑ **STDP.** which calculates a population standard deviation.
- ❑ **STDS.** which calculates a sample standard deviation.

**Example:** Using PARTITION\_AGGR to Calculate a Population Standard Deviation

The following request uses the STDP aggregation operator in PARTITION\_AGGR to calculate the standard deviation for each category.

```
TABLE FILE ggsales
PRINT DOLLARS
COMPUTE STDP1/D12.2M = PARTITION_AGGR(DOLLARS, CATEGORY, B, E, STDP);
BY CATEGORY
BY PRODUCT
ON TABLE SET PAGE NOLEAD
ON TABLE SET STYLE *
GRID=OFF,$
ENDSTYLE
END
```

Partial output is shown in the following image.

<u>Category</u>	<u>Product</u>	<u>Dollar Sales</u>	<u>STDP1</u>
Coffee	Capuccino	20805	\$6,358.13
		20748	\$6,358.13
		20376	\$6,358.13
		20028	\$6,358.13
		19905	\$6,358.13
...			
<u>Category</u>	<u>Product</u>	<u>Dollar Sales</u>	<u>STDP1</u>
Food	Biscotti	18200	\$6,565.19
		18084	\$6,565.19
		17100	\$6,565.19
		16918	\$6,565.19
		16656	\$6,565.19
...			
<u>Category</u>	<u>Product</u>	<u>Dollar Sales</u>	<u>STDP1</u>
Gifts	Coffee Grinder	7752	\$4,518.06
		7715	\$4,518.06
		7623	\$4,518.06
		7485	\$4,518.06

## Output Format Enhancements

This topic describes enhancements for output formats generated by the HOLD, SAVE, and SAVB commands.

### Generating Format XLSX Worksheets in FOCUS

In prior releases of FOCUS, you needed to use the SET EXCELSERVURL parameter to a WebFOCUS servlet in order to generate FORMAT XLSX output. Now, you can use the following SET EXCELSERVURL command to generate the output within FOCUS, without needing an installation of WebFOCUS.

```
SET EXCELSERVURL = LOCAL
```

You can place this command in a supported profile, in a FOCEXEC, or in a TABLE request (using the syntax ON TABLE SET EXCELSERVURL LOCAL).

## Defining a Hyperlink Color for a Report Component

You can use the HYPERLINK-COLOR attribute in a StyleSheet to designate a color for a hyperlink within a report. This applies to all hyperlinks generated in the report. You can define a single color for the entire report or different colors for each individual component.

### **Syntax:** How to Define a Hyperlink Color

`TYPE = type, HYPERLINK-COLOR = color`

where:

*type*

Is the report component you wish to affect. You can apply this keyword to the entire report using TYPE=REPORT. The attribute can also individually be set for any other element of the report.

*color*

Can use any style sheet supported color value designation.

### **Example:** Defining a Hyperlink Color

The following PDF request illustrates how to define hyperlink colors for the entire report, as well as individual elements.

- ☐ The default font color for the entire report is grey and the default hyperlink color for the entire report is slate blue.
- ☐ For the Dollar Sales column (DOLLARS), the font color is green and the hyperlink color is purple.
- ☐ For both the Dollar Sales column (DOLLARS) and the Unit Sales column (UNITS), conditional styling has been applied using the same condition (REGION GE 'O').
- ☐ For the Unit Sales column (UNITS), when the conditional styling is met, the hyperlink color is inherited from the default hyperlink color for the report (slate blue).
- ☐ For the Dollar Sales column (DOLLARS), when the conditional styling is met, the hyperlink color is purple.

```

TABLE FILE GGSales
SUM DOLLARS/D12CM UNITS/D12C
BY REGION
BY CATEGORY
HEADING
"Hyperlinks of Many Colors"
" "
ON TABLE SET PAGE-NUM OFF
ON TABLE HOLD AS PDFHYP FORMAT PDF
ON TABLE SET STYLE *
TYPE=REPORT, SQUEEZE=ON, FONT=ARIAL, GRID=OFF, COLOR=GREY,
HYPERLINK-COLOR='SLATE BLUE',$
TYPE=DATA, COLUMN=UNITS, WHEN=REGION GE 'O', URL='http://www.tibco.com', $
TYPE=DATA, COLUMN=DOLLARS, COLOR=GREEN, HYPERLINK-COLOR='PURPLE',$
TYPE=DATA, COLUMN=DOLLARS, WHEN=REGION GE 'O', URL='http://www.tibco.com', $
ENDSTYLE
END

```

The output is:

### Hyperlinks of Many Colors

Region	Category	Dollar Sales	Unit Sales
Midwest	Coffee	<a href="#">\$4,178,513</a>	332,777
	Food	<a href="#">\$4,404,483</a>	346,421
	Gifts	<a href="#">\$2,931,349</a>	234,463
Northeast	Coffee	<a href="#">\$4,201,057</a>	339,155
	Food	<a href="#">\$4,445,197</a>	357,919
	Gifts	<a href="#">\$2,848,289</a>	227,529
Southeast	Coffee	<a href="#">\$4,435,134</a>	<a href="#">352,357</a>
	Food	<a href="#">\$4,308,731</a>	<a href="#">349,829</a>
	Gifts	<a href="#">\$3,037,420</a>	<a href="#">237,928</a>
West	Coffee	<a href="#">\$4,493,483</a>	<a href="#">358,426</a>
	Food	<a href="#">\$4,204,333</a>	<a href="#">340,367</a>
	Gifts	<a href="#">\$2,977,092</a>	<a href="#">235,042</a>



## Inserting Text and Images Into XLSX Workbook Headers and Footers

FOCUS supports the insertion of text and images into Excel headers and footers and the definition of key page settings to support the placement of text and images in relationship to the overall worksheet and the Excel generated page breaks. This access to the Excel page functionality is designed to enhance overall usability of the worksheets for users who will be printing these reports. Page settings including orientation, page size, and page margins will directly affect the layout of each Excel page based on values defined within the FOCEXEC. Images and text can be included on headers and footers on every printed page, on the first page of the report only, or only on all subsequent pages. The FOCUS headings and footings continue to display within the worksheet. With this feature, FOCUS can insert logos to be printed once at the top of a report and watermark images that need to be displayed on every printed page.

### **Syntax:** How to Insert Text and Images Into XLSX Workbook Headers and Footers

To place images in XLSX Workbook headers and footers, the syntax is:

```
TYPE={PAGEHEADER|PAGEFOOTER},OBJECT=IMAGE,
IMAGE=imagename, JUSTIFY={LEFT|CENTER|RIGHT}
[,DISPLAYON={FIRST|NOT-FIRST}] [,SIZE=(w h)],
```

To place text in XLSX Workbook headers and footers, the syntax is:

```
TYPE={PAGEHEADER|PAGEFOOTER},OBJECT=STRING,
TEXT=text, JUSTIFY={LEFT|CENTER|RIGHT}
[,DISPLAYON={FIRST|NOT-FIRST}] ,
```

where:

**PAGEHEADER**

Places the text or image in the worksheet header.

**PAGEFOOTER**

Places the text or image in the worksheet footer.

*imagename*

Is the name of a valid image file to be placed in the header or footer. The image must be located in the defined application path or allocated to a DDNAME accessible to FOCUS.

The image types supported are GIF and JPEG.

*text*

Is the text to be placed in the header or footer.

**JUSTIFY={LEFT|CENTER|RIGHT}**

Identifies the area in the header or footer to contain the text or image and the justification or placement within that defined area.

### DISPLAYON

Defines whether the text or image should be placed on the first page only or on all pages except the first. Omit this attribute to place the text or image on all pages.

Valid values are:

- ☐ FIRST places the text or image only on the first page.
- ☐ NOT-FIRST places the text or image on every page, except the first page.

### SIZE=( *w h* )

Is the size of the image. By default, an image is added at its original size.

*w* is the width of the image, expressed in the unit of measurement specified by the UNITS parameter.


*h* is the height of the image, expressed in the unit of measurement specified by the UNITS parameter.

## **Example:** Inserting Images in Excel Headers and Footers and Defining Page Settings


The following request against the GGSALES data source places the image gglogo.gif on the left header area of the first page and the right header area of every subsequent page of the resulting worksheet. It places the same image in the center area of the footer on every page. The image file is in a data set allocated to DDNAME GIF.

```
SET EXCELSERVURL = LOCAL
TABLE FILE GGSALES
SUM DOLLARS UNITS BUDDOLLARS BUDUNITS
BY REGION
BY ST
BY CATEGORY
BY PRODUCT
ON TABLE SET BYDISPLAY ON
ON TABLE HOLD AS XLSXHD1 FORMAT XLSX
ON TABLE SET STYLE *
FONT=ARIAL,SIZE=12,
XLSXPAGESETS=ON,TOPMARGIN=1,BOTTOMMARGIN=1,ORIENTATION=LANDSCAPE,
PAGESIZE=LETTER,$
TYPE=TITLE, COLOR=WHITE, BACKCOLOR=GREY,$
TYPE=PAGEHEADER, OBJECT=IMAGE, JUSTIFY=LEFT, IMAGE=GGLOGO.GIF,
DISPLAYON=FIRST,$
TYPE=PAGEHEADER, OBJECT=IMAGE, JUSTIFY=RIGHT, IMAGE=GGLOGO.GIF,
DISPLAYON=NOT-FIRST,$
TYPE=PAGEFOOTER, OBJECT=IMAGE, JUSTIFY=CENTER, IMAGE=GGLOGO.GIF,$
END
```


The first page of output has the image in the left area of the header and in the center area of the footer, as shown in the following image.



Region	State	Category	Product	Dollar Sales	Unit Sales	Budget Dollars	Budget Units		
Midwest	IL	Coffee	Espresso	420439	32237	401477	32416		
Midwest	IL	Coffee	Latte	978340	77344	964787	79015		
Midwest	IL	Food	Biscotti	417469	32321	422397	32941		
Midwest	IL	Food	Croissant	549366	43300	528255	43271		
Midwest	IL	Food	Scone	595069	45355	567231	45091		
Midwest	IL	Gifts	Coffee Grinder	280760	22948	289747	23011		
Midwest	IL	Gifts	Coffee Pot	204828	15785	208255	16035		
Midwest	IL	Gifts	Mug	376754	30157	388612	30881		
Midwest	IL	Gifts	Thermos	187901	14651	181159	14137		
Midwest	MO	Coffee	Espresso	419143	32596	416875	32787		
Midwest	MO	Coffee	Latte	966981	77347	921336	77141		
Midwest	MO	Food	Biscotti	368077	29188	360403	28764		
Midwest	MO	Food	Croissant	619991	49451	602785	50131		
Midwest	MO	Food	Scone	481953	37602	478691	36573		
Midwest	MO	Gifts	Coffee Grinder	181570	14614	171501	14779		
Midwest	MO	Gifts	Coffee Pot	190153	14807	191451	14970		
Midwest	MO	Gifts	Mug	343852	27040	324488	26837		
Midwest	MO	Gifts	Thermos	195686	15592	189484	15903		
Midwest	TX	Coffee	Espresso	455365	36321	439880	36666		
Midwest	TX	Coffee	Latte	938245	76932	941677	77501		
Midwest	TX	Food	Biscotti	363438	28904	340295	28391		
Midwest	TX	Food	Croissant	590722	47130	590005	47228		
Midwest	TX	Food	Scone	418398	33170	398437	32112		
Midwest	TX	Gifts	Coffee Grinder	204292	16440	200241	16625		
Midwest	TX	Gifts	Coffee Pot	204897	16564	214301	16774		
Midwest	TX	Gifts	Mug	366337	29521	383050	29374		
Midwest	TX	Gifts	Thermos	194319	16344	193367	16779		
Northeast	CT	Coffee	Capuccino	158995	12386	141574	11098		
Northeast	CT	Coffee	Espresso	279373	22482	299854	23676		
Northeast	CT	Coffee	Latte	926052	74623	953855	74427		
Northeast	CT	Food	Biscotti	634580	49229	620381	49144		
Northeast	CT	Food	Croissant	551489	45847	580168	46335		



The second page of output has the image in the right area of the header and in the center area of the footer, as shown in the following image.

Northeast	CT	Food	Scone	283874	22378	269221	21038		
Northeast	CT	Gifts	Coffee Grinder	169908	13691	159620	13117		
Northeast	CT	Gifts	Coffee Pot	208209	15523	197051	15190		
Northeast	CT	Gifts	Mug	392967	31728	424333	32415		
Northeast	CT	Gifts	Thermos	221827	17568	219025	17667		
Northeast	MA	Coffee	Capuccino	174344	15358	192747	15672		
Northeast	MA	Coffee	Espresso	248356	19698	254310	19888		
Northeast	MA	Coffee	Latte	917737	74572	941438	73874		
Northeast	MA	Food	Biscotti	570391	47064	616766	48246		
Northeast	MA	Food	Croissant	497234	41029	519322	41351		
Northeast	MA	Food	Scone	332486	25363	312004	23774		
Northeast	MA	Gifts	Coffee Grinder	177940	14382	187686	15384		
Northeast	MA	Gifts	Coffee Pot	184119	15349	184071	15171		
Northeast	MA	Gifts	Mug	401944	32360	401617	31324		
Northeast	MA	Gifts	Thermos	203435	16734	208436	16921		
Northeast	NY	Coffee	Capuccino	208756	17041	227170	17662		
Northeast	NY	Coffee	Espresso	322378	25947	318738	26212		
Northeast	NY	Coffee	Latte	965066	77048	964733	76528		
Northeast	NY	Food	Biscotti	662237	53500	658781	51808		
Northeast	NY	Food	Croissant	622095	50518	640032	50178		
Northeast	NY	Food	Scone	290811	22991	284478	23603		
Northeast	NY	Gifts	Coffee Grinder	161352	12904	164336	12796		
Northeast	NY	Gifts	Coffee Pot	198452	15313	192227	15043		
Northeast	NY	Gifts	Mug	349300	27409	344364	26801		
Northeast	NY	Gifts	Thermos	178836	14568	187786	15179		
Southeast	FL	Coffee	Capuccino	317027	24143	285194	23092		
Southeast	FL	Coffee	Espresso	256539	19730	236531	18690		
Southeast	FL	Coffee	Latte	889887	71123	886465	72975		
Southeast	FL	Food	Biscotti	511597	40606	516984	41242		
Southeast	FL	Food	Croissant	602076	50175	644884	51437		
Southeast	FL	Food	Scone	311836	24543	299547	24576		
Southeast	FL	Gifts	Coffee Grinder	268384	20441	247445	20340		
Southeast	FL	Gifts	Coffee Pot	212057	16145	215467	16470		

**Example: Inserting Text and Images in Excel Report Output**

The following request against the GGSALES data source places the gglogo.gif image in the left header area and text in the center header area of the worksheet. It also places the image in the left footer area and text in the center footer area. The image is in a data set allocated to DDNAME GIF.

```

SET EXCELSERVURL=LOCAL
TABLE FILE GGSALES
SUM DOLLARS UNITS BUDDOLLARS BUDUNITS
BY REGION
BY ST
BY CATEGORY
BY PRODUCT
WHERE REGION EQ 'West'
ON TABLE SET BYDISPLAY ON
ON TABLE HOLD AS XLSXHD2 FORMAT XLSX
ON TABLE SET STYLE *
FONT=ARIAL,SIZE=12,
XLSXPAGESETS=ON,TOPMARGIN=1,BOTTOMMARGIN=1,ORIENTATION=LANDSCAPE,
PAGESIZE=LETTER,$
TYPE=TITLE, COLOR=WHITE, BACKCOLOR=GREY,$
TYPE=PAGEHEADER, OBJECT=IMAGE, JUSTIFY=LEFT, IMAGE=GGLOGO.GIF,$
TYPE=PAGEHEADER, OBJECT=STRING, JUSTIFY=CENTER,
TEXT=Budget Sales for West Region, FONT=ARIAL, SIZE=14,$
TYPE=PAGEFOOTER, OBJECT=IMAGE, JUSTIFY=LEFT, IMAGE=GGLOGO.GIF,$
TYPE=PAGEFOOTER, OBJECT=STRING, JUSTIFY=CENTER,
TEXT=End of Report, FONT=ARIAL, SIZE=12,$
ENDSTYLE
END

```

The output is shown in the following image.

[illegible]

**Reference:** Usage Notes for Inserting Images Into XLSX Worksheet Headers and Footers

- ❑ The Excel headers and footers are not automatically sized based on contents of the areas.
- ❑ Define page margins within the page settings (XLSPAGESETS) to account for the space required to display the images within each page of the report.
- ❑ The image sizing based on the specified height and width is not proportional. Sizing may cause image distortion.

## Synchronizing FOCUS Page Breaks With Excel Page Breaks

FOCUS page breaks in format XLSX report output are now synchronized with Excel page breaks.

## Controlling The Synchronization of FOCUS Page Breaks With Excel Page Breaks

The SET parameter XLSXPAGEBRKIGNORE controls whether page breaks in FOCUS format XLSX report output insert Excel page breaks at the same location in the output.

**Syntax: How to Control Synchronization of FOCUS Page Breaks With Excel Page Breaks**

In a procedure or profile, use the following syntax.

```
SET XLSXPAGEBRKIGNORE = {OFF|ON}
```

In a request, use the following syntax.

```
SET XLSXPAGEBRKIGNORE {OFF|ON}
```

where:

OFF

Synchronizes FOCUS page breaks with Excel page breaks in format XLSX report output. This is the default value.

ON

Does not synchronize FOCUS page breaks with Excel page breaks in format XLSX report output. This value conforms to behavior in prior releases.

**Example: Synchronizing FOCUS Page Breaks With Excel Page Breaks in Format XLSX Report Output**

The following request generates format XLSX report output with WebFOCUS page breaks that are inserted using the BY REGION PAGE-BREAK phrase.

```
SET XLSXPAGEBRKIGNORE=OFF
TABLE FILE GGSales
"HEADING Regions : <REGION"
SUM UNITS DOLLARS
BY REGION PAGE-BREAK
BY DATE
ACROSS CATEGORY
WHERE CITY LE 'Memphis'
ON TABLE SET EXCELSERVURL LOCAL
ON TABLE HOLD AS XLSXPg1 FORMAT XLSX
ON TABLE SET STYLE *
XLSXPAGESETS=ON,
TOPMARGIN=1.25, BOTTOMMARGIN=1, ORIENTATION=LANDSCAPE, $
TYPE=REPORT, FONT=ARIAL, SIZE=9, $
TYPE=ACROSSTITLE, STYLE=BOLD, SIZE=10, $
TYPE=ACROSSVALUE, STYLE=BOLD, SIZE=10, $
TYPE=TITLE, STYLE=BOLD, SIZE=10, $
ENDSTYLE
END
```

## Output Format Enhancements

Partial output is shown in the following image, using the Excel Page Break Preview view. XLSXPAGEBRKIGNORE is set to OFF (the default value). The default Excel page breaks are synchronized with the page breaks specified in the WebFOCUS request.

HEADING Regions : Midwest							
Region	Date	Category		Food		Gifts	
		Coffee	Dollar	Unit Sales	Dollar	Unit Sales	Dollar
Midwest	1936/01/01	6531	81602	3167	115633	7061	84387
	1936/02/01	8405	110197	3627	115310	6781	87148
	1936/03/01	10009	126453	3220	115376	7610	104120
	1936/04/01	5558	72712	7832	33820	6633	80624
	1936/05/01	3355	127929	3168	113401	7218	82503
	1936/06/01	13762	177687	12058	155633	5827	73346
	1936/07/01	6626	84121	3782	132130	6831	86735
	1936/08/01	9125	110957	8316	113884	7368	90011
	1936/09/01	11571	141458	3331	116130	4830	68174
	1936/10/01	9534	124045	3318	123345	5836	76308
	1936/11/01	3381	111134	2876	112107	6844	85061
	1936/12/01	10022	118436	10417	137812	5683	69367
	1937/01/01	10051	131215	10481	123142	4423	53716
	1937/02/01	8273	102430	6321	73240	7140	83851
	1937/03/01	3170	112160	8235	106570	6776	87083
	1937/04/01	3740	113463	10634	141545	6736	87743
	1937/05/01	10122	123448	7377	102583	5633	75124
	1937/06/01	7219	87517	7100	31705	5200	53939
	1937/07/01	12136	148383	10336	137318	5387	68755
	1937/08/01	8075	103510	10363	131324	6138	75038
	1937/09/01	10300	125846	11033	140761	6321	75633
	1937/10/01	10421	123220	10040	124644	5841	71504
	1937/11/01	7452	30677	8186	105241	8267	35248
	1937/12/01	3926	124043	11308	133631	11437	150518
	1938/01/01			2308	33057		
	1938/02/01						
	1938/03/01					3609	47468
HEADING Regions : Northeast							
Region	Date	Category		Food		Gifts	
		Coffee	Dollar	Unit Sales	Dollar	Unit Sales	Dollar
Northeast	1936/01/01	5640	70645	3868	42752	3135	35862
	1936/02/01	5458	63192	5165	58735	3360	43350
	1936/03/01	5627	71216	4218	48503	3405	40236
	1936/04/01	5060	67037	6218	76260	2432	23529
	1936/05/01	2030	27487	5777	79075	3651	46815
	1936/06/01	4882	53037	5860	74237	2557	23315
	1936/07/01	6147	80630	6081	76133	3388	44646
	1936/08/01	3741	42215	4630	53948	3536	43371
	1936/09/01	4307	47351	5215	66463	2680	34084
	1936/10/01	4754	58487	3977	56265	2918	34147
	1936/11/01	6037	71142	4406	54883	3303	42283
	1936/12/01	6843	83284	4547	54315	3342	41562
	1937/01/01	4333	64078	3722	47657	3144	37372
	1937/02/01	3030	36627	4433	57128	3553	42484
	1937/03/01	1944	23475	4378	53408	2923	36536
	1937/04/01	5347	64376	4566	43641	2830	32902
	1937/05/01	4264	54002	3327	38047	5101	63333
	1937/06/01	5319	63633	4725	54663	3536	40376
	1937/07/01	4620	57414	5223	68417	3721	43458
	1937/08/01	3681	41876	4123	51233	1532	18102
	1937/09/01	3446	46446	5445	62675	3550	44320
	1937/10/01	4476	51433	4544	60315	3622	51139
	1937/11/01	3785	45193	5343	63002	3203	35275
	1937/12/01	3537	42435	3533	33552	3671	48235
HEADING Regions : Southeast							



Changing the value of the XLSXPAGEBRKIGNORE parameter to ON produces the following partial output, in which the Excel page breaks are not synchronized with the FOCUS page breaks.

HEADING Region: Midwest							
Region	Date	Category		Food		Gifts	
		Coffee					
		Unit	Dollar	Unit	Dollar	Unit	Dollar
Midwest	1996/01/01	8591	81602	9167	115693	7061	84381
	1996/02/01	8405	110197	9627	115910	6781	87148
	1996/03/01	10009	126459	9220	115976	7610	104120
	1996/04/01	5558	72712	7892	99820	6632	80624
	1996/05/01	9355	127929	9168	119401	7218	82504
	1996/06/01	13762	177687	12058	155633	5927	73946
	1996/07/01	6626	84121	9782	132130	6891	86735
	1996/08/01	9125	110957	8916	113884	7368	90011
	1996/09/01	11571	141458	9391	116130	4890	68174
	1996/10/01	9534	124045	9918	129945	5898	76308
	1996/11/01	9391	111124	8976	112107	6844	85061
	1996/12/01	10022	119498	10417	137812	5689	69361
	1997/01/01	10051	137215	10481	129142	4429	53716
	1997/02/01	8273	102490	8321	79240	7140	83851
	1997/03/01	9170	112160	8295	106570	6776	87081
	1997/04/01	9740	113468	10694	141545	6796	87741
	1997/05/01	10122	129448	7977	102583	5699	75124
	1997/06/01	7219	87517	7100	91705	5200	59999
	1997/07/01	12136	148989	10936	137918	5987	68755
	1997/08/01	8075	103510	10369	131924	6198	75031
	1997/09/01	10300	125846	11033	140761	6321	75634
	1997/10/01	10421	129220	10040	124644	5841	71504
	1997/11/01	7452	90677	8186	105241	8267	95248
	1997/12/01	9926	124049	11308	139691	11437	150518
	1997/12/02	.	.	2908	39057	.	.
	1997/12/31	.	.	.	.	3609	47461
HEADING Region: Northeast							
Region	Date	Category		Food		Gifts	
		Coffee					
		Unit	Dollar	Unit	Dollar	Unit	Dollar
Northeast	1996/01/01	5640	70645	3868	42752	3195	35862
	1996/02/01	5458	68192	5165	58795	3960	44951
	1996/03/01	5627	71216	4218	48509	3405	40296
	1996/04/01	5060	67037	6218	76260	2432	29524
	1996/05/01	2090	27487	5777	79075	3651	46815
	1996/06/01	4882	59037	5860	74237	2557	29915
	1996/07/01	6147	80620	6081	76199	3388	44646
	1996/08/01	3741	42215	4620	59948	3936	43327
	1996/09/01	4307	47351	5275	66469	2680	34084
	1996/10/01	4754	59487	3977	56265	2918	34147
	1996/11/01	6097	71142	4406	54883	3303	42281
	1996/12/01	6843	83284	4547	54915	3342	41562
	1997/01/01	4933	64078	3722	47657	3144	37372
	1997/02/01	3030	36627	4493	57128	3553	42484
	1997/03/01	1944	23475	4378	53408	2929	36596
	1997/04/01	5947	64976	4566	49641	2890	32902
	1997/05/01	4264	54002	3327	38047	5101	63993
	1997/06/01	5319	63699	4725	54663	3536	40376
	1997/07/01	4620	57414	5229	68417	3721	43458
	1997/08/01	3681	48376	4129	51299	1532	18102
	1997/09/01	3448	46446	5645	62675	3550	44920
	1997/10/01	4476	51438	4544	60315	3622	51191
	1997/11/01	3785	45193	5343	69002	3209	35275
	1997/12/01	3537	42495	3533	39552	3671	48295
HEADING Region: Southeast							
Region	Date	Category		Food		Gifts	
		Coffee					
		Unit	Dollar	Unit	Dollar	Unit	Dollar
Southeast	1996/01/01	6966	88918	9643	118107	7209	94501
	1996/02/01	7912	93609	10573	132460	5774	69596
	1996/03/01	11317	147751	9027	119034	5780	72420
	1996/04/01	9416	122340	11078	126894	6732	83141
	1996/05/01	9873	113173	9718	118244	6805	89074
	1996/06/01	8976	103181	7411	93361	4248	52292
	1996/07/01	9087	113889	11413	133714	6647	88314
	1996/08/01	10549	136673	8681	93857	6509	87375
	1996/09/01	8714	116968	8822	109615	5110	65773
	1996/10/01	9632	120356	10488	126242	6052	75588

## Scaling PDF Report Output to Fit the Page Width

By default, if PDF report output is too wide to fit on a single page, the report generates multiple panels of the same page for the columns that do not fit. The page numbers specify the page and panel numbers. For example, page numbers 1.1 and 1.2 represent page 1/panel 1 and page 1/panel 2.

You can scale the output to fit across the width of the page using the PAGE-SCALE StyleSheet attribute or the PAGE-SCALE SET parameter.

### **Syntax:** How to Scale PDF Report Output to Fit the Page Width

In a StyleSheet, use the following syntax.

```
TYPE=REPORT, PAGE-SCALE={OFF|AUTO}, $
```

In a procedure or profile, use the following syntax.

```
SET PAGE-SCALE = {OFF|AUTO}
```

In a request, use the following syntax.

```
ON TABLE SET PAGE-SCALE {OFF|AUTO}
```

where:

[OFF](#)

Disables page scaling in PDF report output. This is the default value.

[AUTO](#)

Implements page scaling in PDF report output.

### **Reference:** Usage Notes for PAGE-SCALE

- ❑ PAGE-SCALE is supported for PDF report output only.
- ❑ When a page is scaled to fit more content on the page horizontally, fewer vertical pages may be generated, as well.

**Example:    Scaling PDF Report Output to Fit the Page Width**

The following request generates PDF report output without page scaling.

```
TABLE FILE GGSALES
SUM DOLLARS BUDDOLLARS UNITS BUDUNITS
BY CATEGORY
BY PRODUCT
BY REGION
BY ST
BY CITY
WHERE CATEGORY EQ 'Food' OR 'Gifts'
ON TABLE HOLD AS PGSCALE1 FORMAT PDF
END
```

The output is too wide for the page and is paneled. Page 1.1 has the columns that fit across the width of the page, as shown in the following image.

PAGE	1.1			
Category	Product	Region	State	City
Food	Biscotti	Midwest	IL	Chicago
			MO	St. Louis
			TX	Houston
		Northeast	CT	New Haven
			MA	Boston
			NY	New York
		Southeast	FL	Orlando
			GA	Atlanta
			TN	Memphis
		West	CA	Los Angeles
				San Francisco
			WA	Seattle
	Croissant	Midwest	IL	Chicago
			MO	St. Louis
			TX	Houston
		Northeast	CT	New Haven
			MA	Boston
			NY	New York
		Southeast	FL	Orlando
			GA	Atlanta
			TN	Memphis
		West	CA	Los Angeles
				San Francisco
			WA	Seattle
	Scone	Midwest	IL	Chicago
			MO	St. Louis
			TX	Houston
		Northeast	CT	New Haven
			MA	Boston
			NY	New York
		Southeast	FL	Orlando
			GA	Atlanta
			TN	Memphis
		West	CA	Los Angeles
				San Francisco
			WA	Seattle
Gifts	Coffee Grinder	Midwest	IL	Chicago
			MO	St. Louis
			TX	Houston
		Northeast	CT	New Haven
			MA	Boston
			NY	New York
		Southeast	FL	Orlando
			GA	Atlanta
			TN	Memphis
		West	CA	Los Angeles
				San Francisco
			WA	Seattle
	Coffee Pot	Midwest	IL	Chicago
			MO	St. Louis
			TX	Houston
		Northeast	CT	New Haven
			MA	Boston
			NY	New York
		Southeast	FL	Orlando
			GA	Atlanta
			TN	Memphis
		West	CA	Los Angeles
				San Francisco
			WA	Seattle
	Mug	Midwest	IL	Chicago
			MO	St. Louis
			TX	Houston
		Northeast	CT	New Haven
			MA	Boston
			NY	New York
		Southeast	FL	Orlando
			GA	Atlanta
			TN	Memphis
		West	CA	Los Angeles

Page 1.2 has the remaining columns, as shown in the following image.

PAGE 1.2							
<u>Dollar</u>	<u>Sales</u>	<u>Budget</u>	<u>Dollars</u>	<u>Unit</u>	<u>Sales</u>	<u>Budget</u>	<u>Units</u>
417469		422397		32321		32941	
368077		360403		29188		28764	
363438		340295		28904		28391	
634580		620381		49229		49144	
570391		616766		47064		48246	
662237		658781		53500		51808	
511597		516984		40606		41242	
555231		568743		43639		44362	
438889		426292		35349		34945	
268026		247780		20906		19699	
269518		273054		22987		21943	
328320		345143		26676		26459	
549366		528255		43300		43271	
619991		602785		49451		50131	
590722		590005		47130		47228	
551489		580168		45847		46335	
497234		519322		41029		41351	
622095		640032		50518		50178	
602076		644884		50175		51437	
661806		666934		53782		54126	
638477		658088		52499		51585	
800084		808357		66049		64432	
824457		799141		65214		66025	
801060		799056		65759		64872	
595069		567231		45355		45091	
481953		478691		37602		36573	
418398		398437		33170		32112	
283874		269221		22378		21038	
332486		312004		25363		23774	
290811		284478		22991		23603	
311836		299547		24543		24576	
273420		294886		22863		22427	
315399		332930		26373		26809	
315584		287477		23595		23067	
292839		305848		24093		24094	
304445		321561		25088		25091	
280760		289747		22948		23011	
181570		171501		14614		14779	
204292		200241		16440		16625	
169908		159620		13691		13117	
177940		187686		14382		15384	
161352		164336		12904		12796	
268384		247445		20441		20340	
217254		202101		16968		16423	
171319		161057		13147		13304	
214557		200567		16845		16563	
187123		178246		14864		14815	
201756		192503		16372		16019	
204828		208255		15785		16035	
190153		191451		14807		14970	
204897		214301		16564		16774	
208209		197051		15523		15190	
184119		184071		15349		15171	
198452		192227		15313		15043	
212057		215467		16145		16470	
232552		247789		18431		19042	
200694		191323		15346		15125	
202285		203774		15278		16203	
197845		215775		15783		16273	
213494		210647		16371		16732	
376754		388612		30157		30881	
343852		324488		27040		26837	
366337		383050		29521		29374	
392967		424333		31728		32415	
401944		401617		32360		31324	
349300		344364		27409		26801	
409466		391236		31628		31590	
355447		384262		29746		29860	
337790		348847		27100		27921	
381926		365269		30279		30043	

The following version of the request uses page scaling.

```
TABLE FILE GGSALES
SUM DOLLARS BUDDOLLARS UNITS BUDUNITS
BY CATEGORY
BY PRODUCT
BY REGION
BY ST
BY CITY
WHERE CATEGORY EQ 'Food' OR 'Gifts'
ON TABLE HOLD AS PGSCALE2 FORMAT PDF
ON TABLE SET STYLE *
TYPE=REPORT, PAGE-SCALE=AUTO, $
ENDSTYLE
END
```

The output is shown in the following image. All of the columns fit across the width of the page, with no paneling.

PAGE 1									
Category	Product	Region	State	City	Dollar Sales	Budget Dollars	Unit Sales	Budget Units	
Food	Biscotti	Midwest	IL	Chicago	417469	422397	22321	22941	
			MO	St. Louis	368077	360403	23188	28754	
			TX	Houston	363438	340295	28904	28391	
		Northeast	CT	New Haven	314580	820381	49229	49144	
			MA	Boston	570391	616766	47054	48246	
			NY	New York	622237	659781	53500	54845	
		Southeast	FL	Orlando	511597	518984	40606	41242	
			GA	Atlanta	555224	558743	43539	44262	
			TN	Memphis	438883	426252	35349	34945	
		West	CA	Los Angeles	268026	247780	20906	19599	
			CA	San Francisco	249516	273054	22967	21943	
			WA	Seattle	328320	345143	26576	26459	
	Croissant	Midwest	IL	Chicago	549368	538255	43300	43771	
			MO	St. Louis	613991	602785	49451	50131	
			TX	Houston	590722	590005	47130	47228	
		Northeast	CT	New Haven	551489	550168	45947	46107	
			MA	Boston	497234	519322	41029	41351	
			NY	New York	620395	640032	50518	51036	
		Southeast	FL	Orlando	602076	644884	50175	51437	
			GA	Atlanta	661806	666934	53782	54126	
			TN	Memphis	336477	350088	52499	51585	
		West	CA	Los Angeles	800084	809357	66049	64432	
			CA	San Francisco	794437	793141	65214	65025	
			WA	Seattle	801060	799056	65759	64872	
	Scone	Midwest	IL	Chicago	595059	567231	45355	45091	
			MO	St. Louis	481953	476891	37602	36573	
			TX	Houston	418398	398437	33170	32112	
		Northeast	CT	New Haven	283874	229221	22378	21038	
			MA	Boston	332486	312004	25363	23774	
			NY	New York	290811	284478	22991	23603	
		Southeast	FL	Orlando	311836	325847	24564	25042	
			GA	Atlanta	273420	294886	22983	22427	
			TN	Memphis	315299	312930	26273	26909	
		West	CA	Los Angeles	315594	287477	23595	23067	
			CA	San Francisco	252839	305648	24093	24094	
			WA	Seattle	304445	311581	25088	25081	
Gifts	Coffee Grinder	Midwest	IL	Chicago	280760	289747	22948	23011	
			MO	St. Louis	181570	171501	14514	14779	
			TX	Houston	204292	200241	16428	16225	
		Northeast	CT	New Haven	165908	159620	13591	13117	
			MA	Boston	177940	187886	14382	15384	
			NY	New York	161352	164336	12904	12796	
		Southeast	FL	Orlando	268394	204441	20441	20240	
			GA	Atlanta	217254	202101	16968	16423	
			TN	Memphis	171319	161057	13147	13304	
		West	CA	Los Angeles	214557	200587	16845	16553	
			CA	San Francisco	187123	179246	14854	14815	
			WA	Seattle	201756	192503	16272	16019	
	Coffee Pot	Midwest	IL	Chicago	204828	209255	16795	16035	
			MO	St. Louis	190153	191451	14807	14870	
			TX	Houston	204897	214303	16564	16774	
		Northeast	CT	New Haven	208209	197051	15523	15190	
			MA	Boston	184113	194071	15349	15371	
			NY	New York	198452	192217	15313	15043	
		Southeast	FL	Orlando	212057	215487	16145	16470	
			GA	Atlanta	212852	247789	18432	19042	
			TN	Memphis	200694	191323	15246	15125	
		West	CA	Los Angeles	202285	203774	15778	16203	
			CA	San Francisco	197845	215775	15793	16273	
			WA	Seattle	213494	210647	16271	16382	
Mug	Mug	Midwest	IL	Chicago	367554	388612	30157	30384	
			MO	St. Louis	343852	324488	27040	26937	
			TX	Houston	366337	363050	29521	29374	
		Northeast	CT	New Haven	392967	424333	31728	32415	
			MA	Boston	401944	401617	32360	31324	
			NY	New York	345200	344164	27409	26801	
		Southeast	FL	Orlando	409446	391236	31628	31590	
			GA	Atlanta	355447	394262	29745	29860	
			TN	Memphis	337790	348847	27100	27921	
		West	CA	Los Angeles	381926	369269	30279	30043	
			CA	San Francisco	379399	369133	29484	29581	
			WA	Seattle	427339	422374	34118	34005	
	Thermos	Midwest	IL	Chicago	187901	181155	14551	14317	
			MO	St. Louis	195686	189484	15592	15903	
			TX	Houston	194319	193367	16244	16779	
		Northeast	CT	New Haven	221827	219015	17588	17667	
			MA	Boston	203435	208436	16734	16921	
			NY	New York	178526	178786	14568	15179	
		Southeast	FL	Orlando	195526	187670	15241	14854	
			GA	Atlanta	227482	215970	17578	17597	
			TN	Memphis	209449	205105	16057	15802	
		West	CA	Los Angeles	207613	208569	16169	16553	
			CA	San Francisco	185115	166580	13874	13374	
			WA	Seattle	198640	200559	15905	16375	

## Adapter Enhancements

This topic describes enhancements for data adapters.

## Generating Table and Column Names With DBMS-Specific Length Limits

The name length limit used in a Master File has been increased to the maximum length supported by the DBMS. In most cases this is 128 characters, although some have shorter limits, including the following:

- ❑ **Oracle.** 30 bytes.

- ❑ **DB2 on z/OS.** 30 bytes.

### SQL Adapters: Optimizing OUTPUTLIMIT

An OUTPUTLIMIT filter in a TABLE request is now, by default, passed to some SQL data sources as FETCH FIRST n ROWS. When needed, it can be suppressed using the optimization setting FEATOPT OUTPUTLIMIT OFF.

For example, the following request against a Db2 data source contains an OUTPUTLIMIT filter:

```
SET TRACEUSER = ON
SET TRACEOFF = ALL
SET TRACEON = STMTRACE//CLIENT
TABLE FILE WFLITE
SUM COGS_US
BY PRODUCT_CATEGORY
IF OUTPUTLIMIT IS 50
END
SET TRACEUSER=OFF
```

The generated SQL request contains the FOR FETCH FIRST 50 ROWS clause:

```
SELECT
T1."ID_PRODUCT",
T1."COGS_US",
T7."ID_PRODUCT",
T7."PRODUCT_CATEGORY"
FROM
( wrd_wf_retail_sales T1
LEFT OUTER JOIN
wrd_wf_retail_product T7
ON T7."ID_PRODUCT" = T1."ID_PRODUCT" )
ORDER BY
T7."PRODUCT_CATEGORY"
FETCH FIRST 50 ROWS ONLY
FOR FETCH ONLY;
```

## Raised Limits

The topic describes increases in limits.

### Raised Limit for Join Fields

In prior releases, the limit for field pairs in a join was 20. The number of join field pairs has now been raised to 128.



## Upgrade Notes

---

This section describes changes in behaviour in this release.

**In this chapter:**

- ☐ [Software Branding](#)
  - ☐ [Technical Content Branding](#)
  - ☐ [Parameters in COBOL User-Written Subroutines](#)
  - ☐ [-REMOTE Commands](#)
- 

### Software Branding

As of the following releases, ibi software and technical content are now branded under TIBCO® Software Inc.

- ☐ **WebFOCUS:** 8207.27.0
- ☐ **FOCUS:** 8207.27.0
- ☐ **iWay Service Manager:** 8.0.5
- ☐ **Omni-Gen:** 3.16.0

This change only impacts the names to which these products are referred. For example, WebFOCUS is now known as TIBCO WebFOCUS®, while iWay DataMigrator is now known as TIBCO® Data Migrator. You will begin to see this change throughout the software and corresponding technical content assets, including PDF covers and KnowledgeBase collections, where both new and former product names will be used interchangeably. For a full list of software branding, see below.

Former Product Name	New Product Name
WebFOCUS	TIBCO WebFOCUS®
WebFOCUS Client	TIBCO WebFOCUS® Client
WebFOCUS Server	TIBCO WebFOCUS® Reporting Server

iWay Data Migrator Server	TIBCO WebFOCUS® Reporting Server
iWay DataMigrator	TIBCO® Data Migrator
WebFOCUS App Studio	TIBCO WebFOCUS® App Studio
WebFOCUS Mobile App	TIBCO WebFOCUS® Mobile App
WebFOCUS Infographics	TIBCO WebFOCUS® Infographics
WebFOCUS Narrative Charts	TIBCO WebFOCUS® Narrative Charts
iWay Service Manager	TIBCO iWay® Service Manager
Omni-Gen	TIBCO Omni-Gen®
Omni Master Data Management	TIBCO Omni-Gen® MDM
Omni for Customer	TIBCO Omni-Gen® MDM
Omni-HealthData	TIBCO Omni-HealthData®
Omni-Insurance	TIBCO Omni-Insurance™
Data Quality Edition	TIBCO Omni-Gen® DQ Edition
iWay Data Quality Server	TIBCO Omni-Gen® DQ Server
FOCUS	TIBCO FOCUS®

## Technical Content Branding

As of Release 8207.27.0, ibi products are now branded under TIBCO® Software Inc. This change only impacts the names to which these products are referred. Specifically, FOCUS is now known as TIBCO FOCUS®. You will begin to see this change throughout the software and corresponding technical content assets, including PDF covers and KnowledgeBase collections, where both new and former product names will be used interchangeably. For a full list of software branding, see [Software Branding](#) on page 57.

The following tables provide a quick overview of the PDF titles that have changed to support this release.

### **TIBCO FOCUS®**

<b>Former Title</b>	<b>New Title</b>
<i>FOCUS for Mainframe and Distributed Systems FOCUS Release Notes</i>	<i>Release Notes</i>
<i>FOCUS for Mainframe and Distributed Systems Overview and Operating Environments</i>	<i>Overview and Operating Environments</i>
<i>FOCUS for Mainframe and Distributed Systems Creating Reports</i>	<i>Creating Reports</i>
<i>FOCUS for Mainframe and Distributed Systems Describing Data</i>	<i>Describing Data</i>
<i>FOCUS for Mainframe and Distributed Systems Developing Applications</i>	<i>Developing Applications</i>
<i>FOCUS for Mainframe and Distributed Systems Maintaining Databases</i>	<i>Maintaining Databases</i>
<i>FOCUS for Mainframe and Distributed Systems Using Functions</i>	<i>Using Functions</i>
<i>FOCUS for Mainframe z/OS Installation Guide</i>	<i>z/OS Installation Guide</i>
<i>FOCUS for Mainframe Relational Data Adapter User's Manual</i>	<i>Relational Data Adapter User's Manual</i>
<i>FOCUS for Mainframe and Distributed Systems Adapter for Db2 Installation Guide</i>	<i>Adapter for Db2 Installation Guide</i>
<i>FOCUS for Mainframe Adapter for Teradata Installation Guide</i>	<i>Adapter for Teradata Installation Guide</i>
<i>FOCUS for Mainframe and Distributed Systems Active Technologies User Guide</i>	<i>Active Technologies User Guide</i>
<i>FOCUS for Mainframe Simultaneous Usage Reference Manual for z/OS</i>	<i>Simultaneous Usage Reference Manual for z/OS</i>

## Parameters in COBOL User-Written Subroutines

In FOCUS versions prior to 7709, parameters for COBOL user-written subroutines could be defined at any level in the COBOL FD.

In 64-bit FOCUS, parameters must all be defined at the same level in the COBOL FD.

Alternatively, you can concatenate the parameters into a single string that you pass to the subroutine, and break it apart within the subroutine.

## -REMOTE Commands

As of Release 8207, when running on zSeries systems, use of the -REMOTE BEGIN, -REMOTE END, and -REMOTE EXEC commands require z/OS V2.3 or higher.

## Known Issues

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The following issues are known to occur in this release of TIBCO® FOCUS.

**In this chapter:**

- ❑ [Current Issues](#)
- 

### Current Issues

- ❑ Pressing the Attention (ATTN) key is supposed to interrupt the current FOCUS process and bring up a menu of options that enables you to decide how to proceed. This is no longer happening. When you press Attention, you are taken to the READY prompt.

**Note:** If you press *Enter* at this point you are taken back to where you were when you selected Attention.



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