Array Dimension Definition

The *array-dimension-definition* is used in the statement DEFINE DATA OBJECT and in the *variable-definition* option of DEFINE DATA LOCAL, DEFINE DATA INDEPENDENT, DEFINE DATA CONTEXT, DEFINE DATA OBJECT.It is also used in the DEFINE FUNCTION statement.

The *array-dimension-definition* has the following syntax:

{*bound*[:*bound*]},... 3

This chapter covers the following topics:

- Function
- Syntax Description

Function

With an *array-dimension-definition*, you define the lower and upper bound of a dimension in an array-definition.

You can define up to 3 dimensions for an array.

See also *Arrays* in the *Programming Guide*.

Syntax Description

Syntax Element	Description
bound	**Lower/Upper Bound:** A bound can be one of the following: • a numeric integer constant; • a previously defined named constant; • (for database arrays) a previously defined user-defined variable; or • an asterisk (*) defines an extensible bound, otherwise known as an X-array (eXtensible array). If only one bound is specified, the value represents the upper bound and the lower bound is assumed to be 1.

X-Arrays

If at least one bound in at least one dimension of an array is specified as extensible, that array is then called an X-array (eXtensible array). Only one bound (either upper or lower) may be extensible in any one dimension, but not both. Multi-dimensional arrays may have a mixture of constant and extensible bounds, for example: `#a(1:100, 1:*)`.

Example:

```
DEFINE DATA LOCAL
1 #ARRAY1(I4/1:10)
1 #ARRAY2(I4/10)
1 #X-ARRAY3(I4/1:*)
1 #X-ARRAY4(I4/*,1:5)
1 #X-ARRAY5(I4/*:10)
1 #X-ARRAY6(I4/1:10,100:*,*:1000)
END-DEFINE
```

In the following table you can see the bounds of the arrays in the above program more clearly.

	Dimension1		Dimension2		Dimension3	
	Lower bound	**Upper bound**	**Lower bound**	**Upper bound**	**Lower bound**	**Upper bound**
#ARRAY1	1	10	-	-	-	-
#ARRAY2	1	10	-	-	-	-
#X-ARRAY3	1	eXtensible	-	-	-	-
#X-ARRAY4	1	eXtensible	1	5	-	-
#X-ARRAY5	eXtensible	10	-	-	-	-
#X-ARRAY6	1	10	100	eXtensible	eXtensible	1000

Examples of array definitions:

```
#ARRAY2(I4/10)                  /* a one-dimensional array with 10 occurrences (1:10)
#X-ARRAY4(I4/*,1:5)             /* a two-dimensional array
#X-ARRAY6(I4/1:10,100:*,*:1000)  /* a three-dimensional array
```

Variable Arrays in a Parameter Data Area

In a parameter data area, you may specify an array with a variable number of occurrences. This is done with the index notation `1:V`.

Example 1: `#ARR01 (A5/1:V)`

Example 2: `#ARR02 (I2/1:V,1:V)`

A parameter array which contains a variable index notation `1:V` can only be redefined in the length of

- its elementary field length, if the `1:V` index is right-most; for example:

`#ARR(A6/1:V)` can be redefined up to a length of 6 bytes
`#ARR(A6/1:2,1:V)` can be redefined up to a length of 6 bytes
`#ARR(A6/1:2,1:3,1:V)` can be redefined up to a length of 6 bytes

- the product of the right-most fixed occurrences and the elementary field length; for example:

  `#ARR(A6/1:V,1:2)` can be redefined up to a length of 2*6 = 12 bytes
  `#ARR(A6/1:V,1:3,1:2)` can be redefined up to a length of 3*2*6 = 36 bytes
  `#ARR(A6/1:2,1:V,1:3)` can be redefined up to a length of 3*6 = 18 bytes

A variable index notation `1:V` cannot be used within a redefinition.

Example:

```
DEFINE DATA PARAMETER
 1 #ARR(A6/1:V)
 1 REDEFINE #ARR
   2 #R-ARR(A1/1:V)   /* (1:V) is not allowed in a REDEFINE block
END-DEFINE
```

As the number of occurrences is not known at compilation time, it must not be referenced with the index notation (*) in the statements `INPUT`, `WRITE`, `READ WORK FILE`, `WRITE WORK FILE`. Index notation (*) may be applied either to all dimensions or to none.

Valid examples:

```
#ARR01 (*)
#ARR02 (*,*)
#ARR01 (1)
#ARR02 (5,#FIELDX)
#ARR02 (1,1:3)
```

Invalid example:

```
#ARRAYY (1,*)  /* not allowed
```

To avoid runtime errors, the maximum number of occurrences of such an array should be passed to the subprogram/subroutine via another parameter. Alternatively, you may use the system variable `*OCCURRENCE`.

Notes:

1. If a parameter data area that contains an index `1:V` is used as a local data area (that is, specified in a `DEFINE DATA LOCAL` statement), a variable named `V` must have been defined as `CONSTANT`.
2. In a dialog, an index `1:V` cannot be used in conjunction with `BY VALUE`.