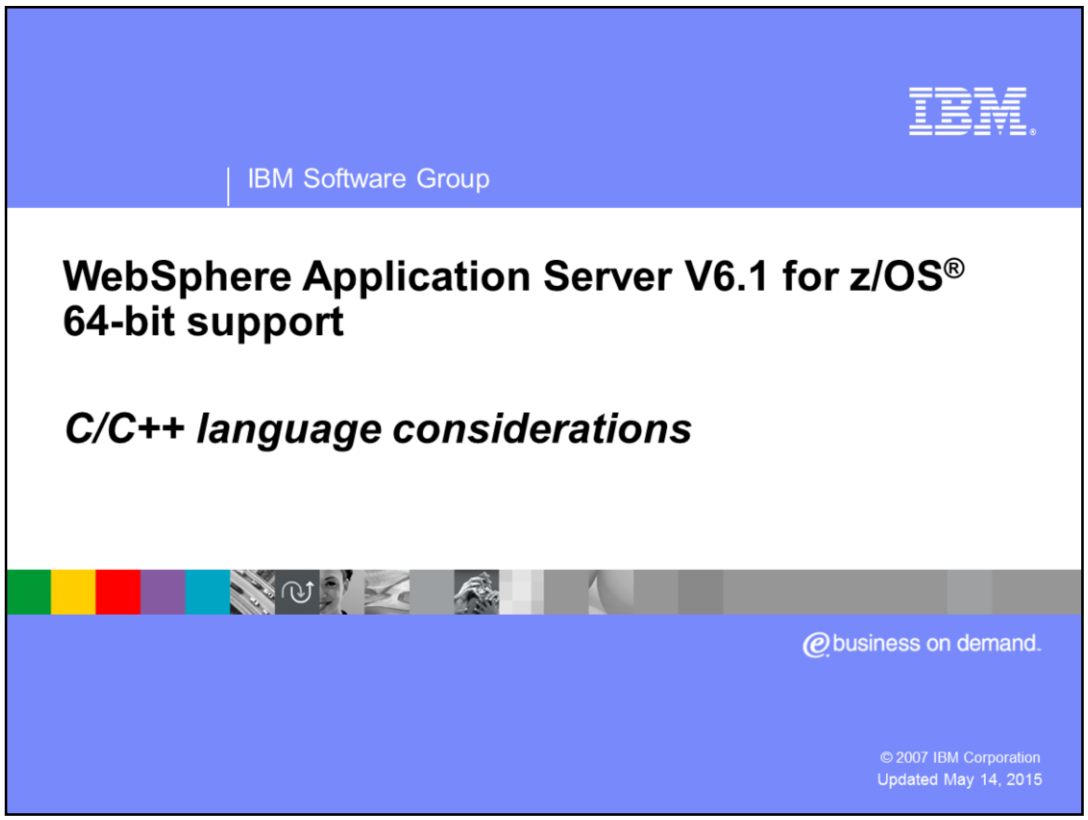
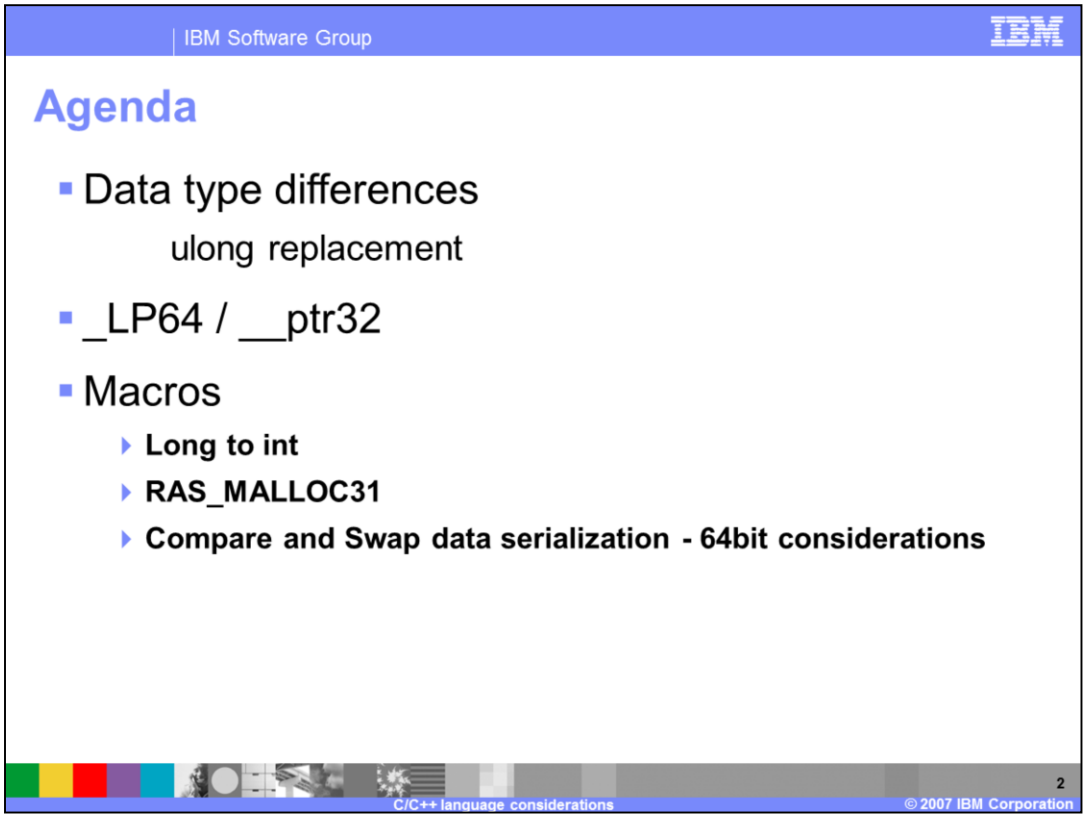
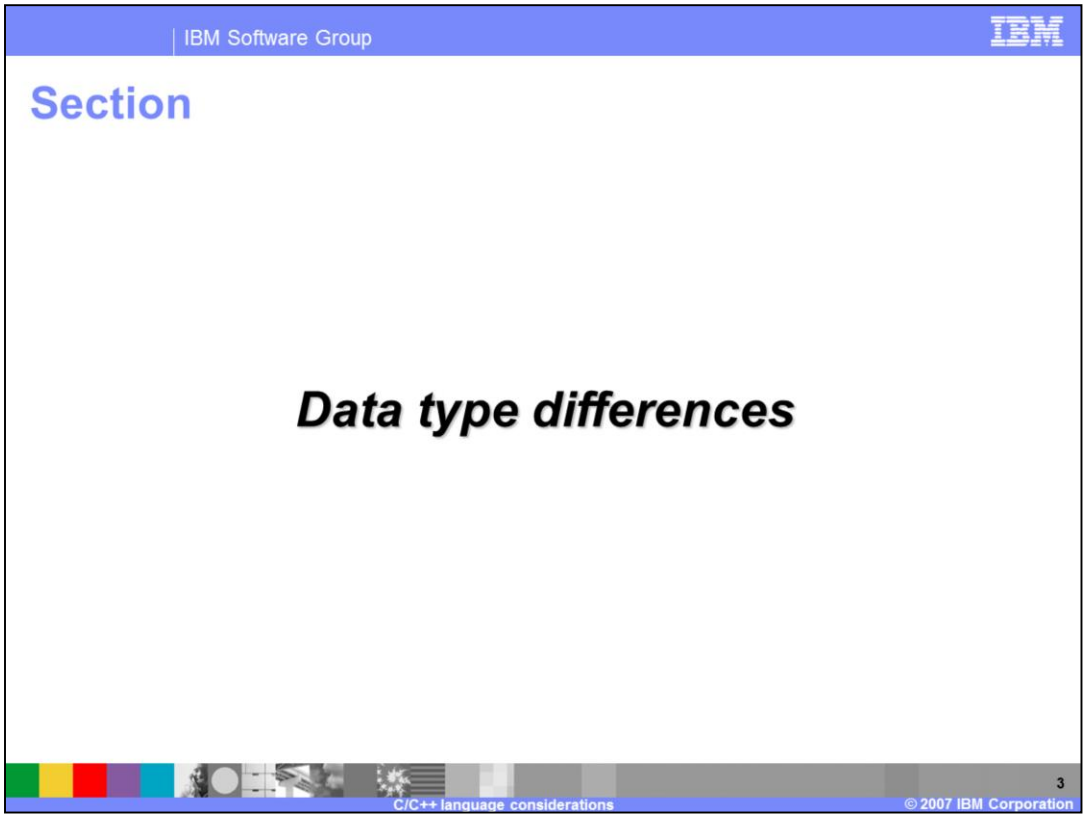


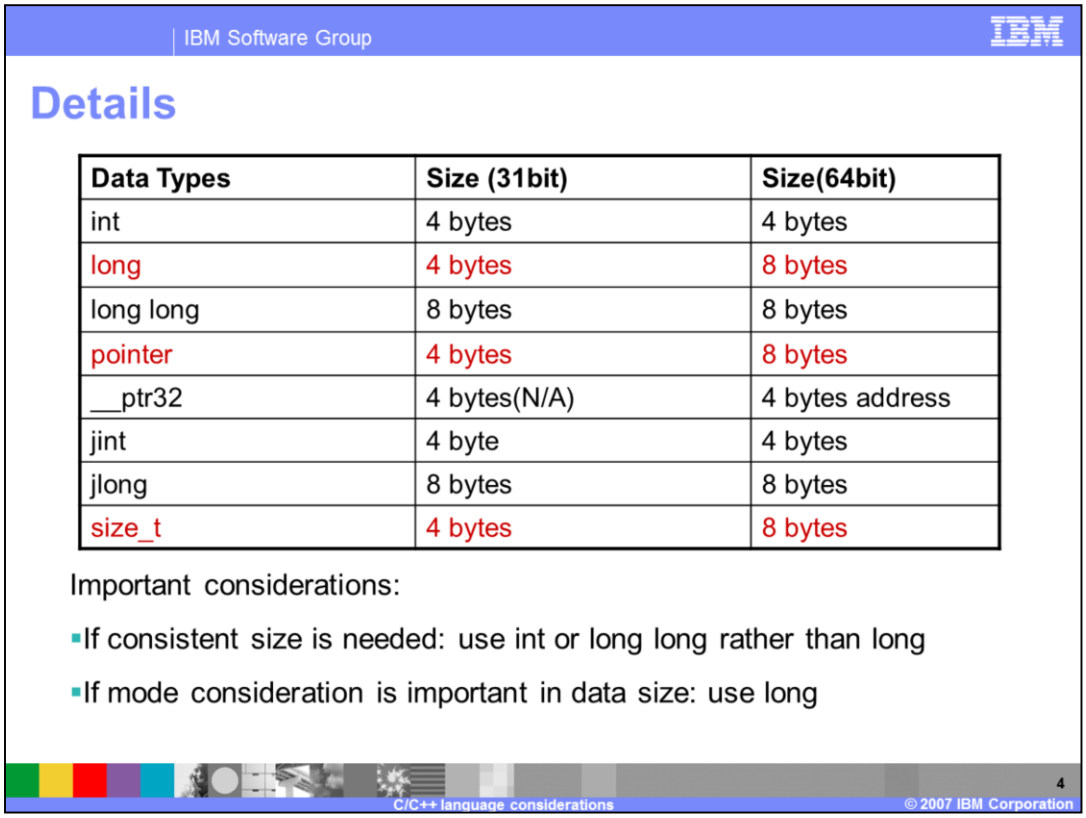
This presentation covers the C/C++ language considerations when using 64-bit support in a WebSphere® Base Application Server V6.1 on z/OS.



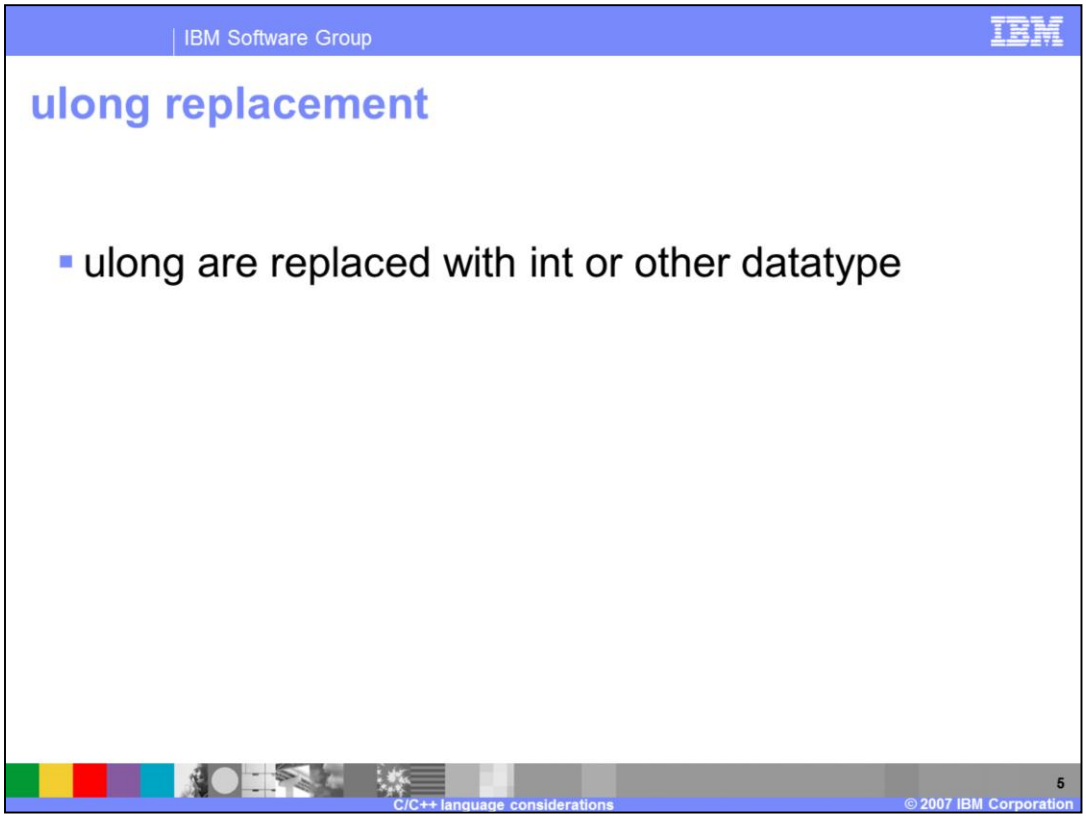
The agenda includes a discussion of data types and macros that were changed or added to enable consistency between 31-bit and 64-bit modes.



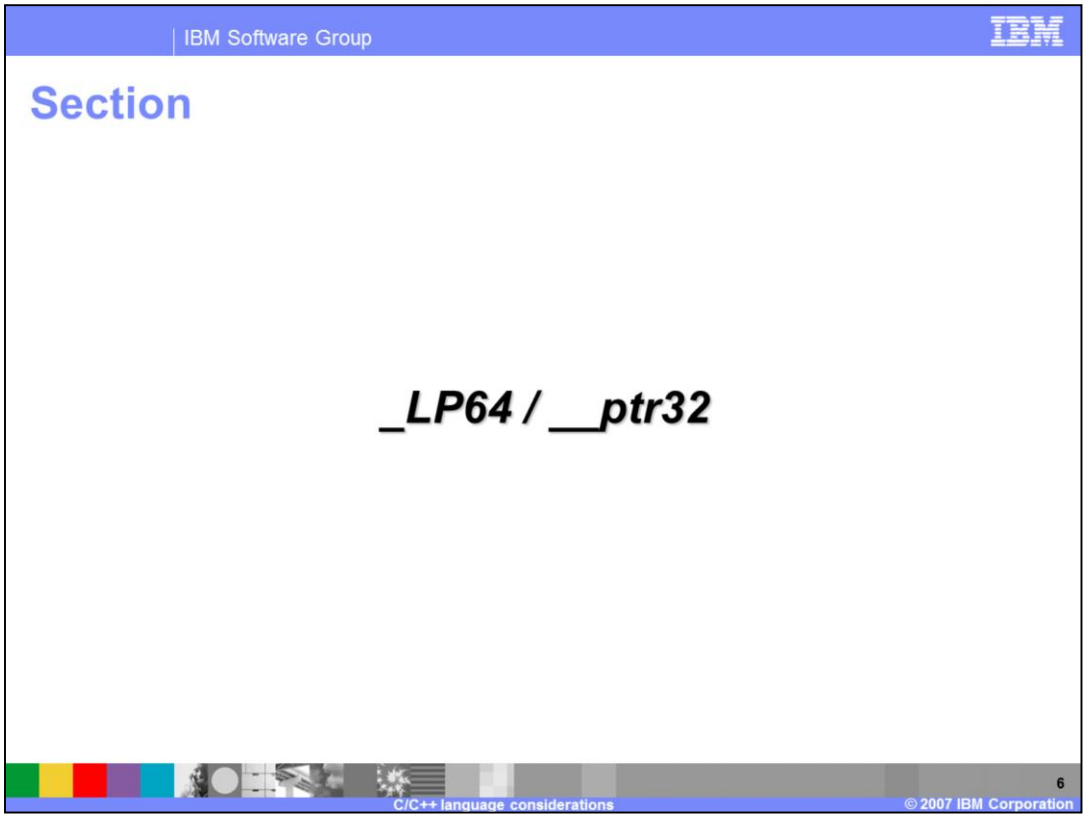
This section covers data type differences between 31-bit and 64-bit modes.



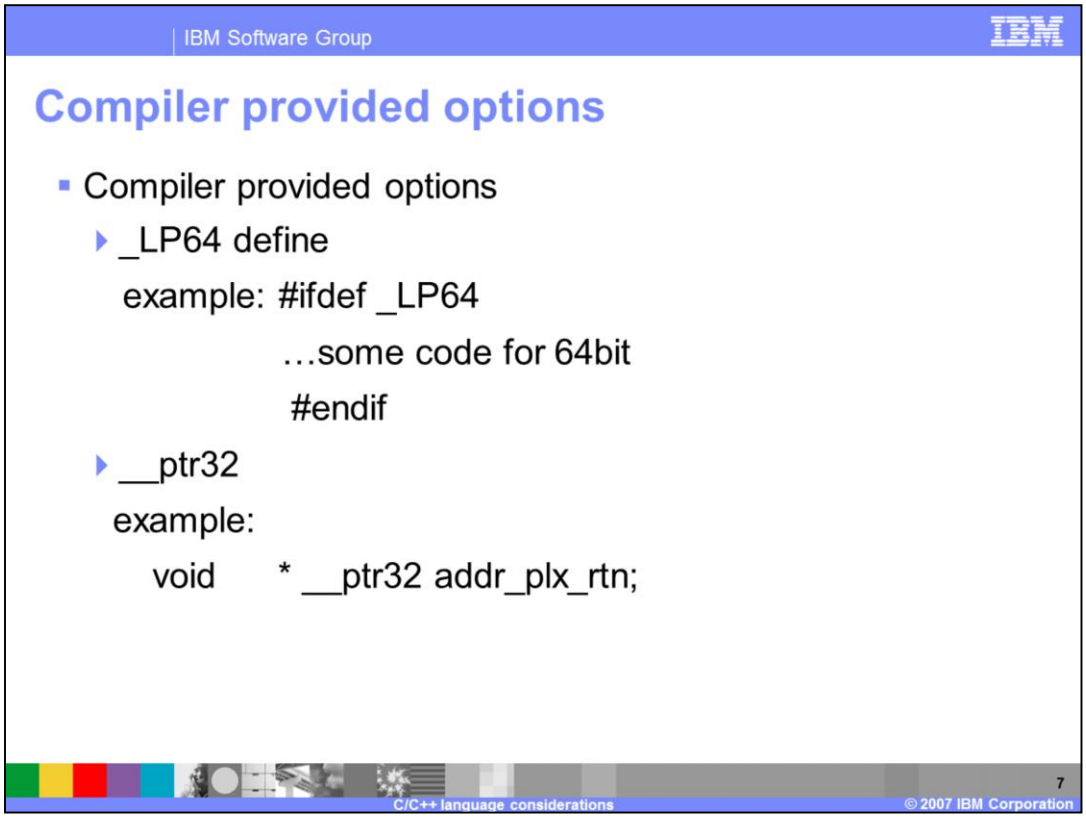
Depending on which mode code is compiled for, some C/C++ native code datatype sizes are changed. The table lists datatype, mode and defined size. These data types should be understood and implemented accordingly.



The ulong datatype size changes in C/C++ native code based on either 31-bit or 64-bit mode. From a common code point of view, this change breaks the structure mapping between C/C++ and PLX. To solve this problem, the ulong type is converted to an int type, which is consistent between 31-bit and 64-bit mode. Other datatypes can be used based on structure requirements.

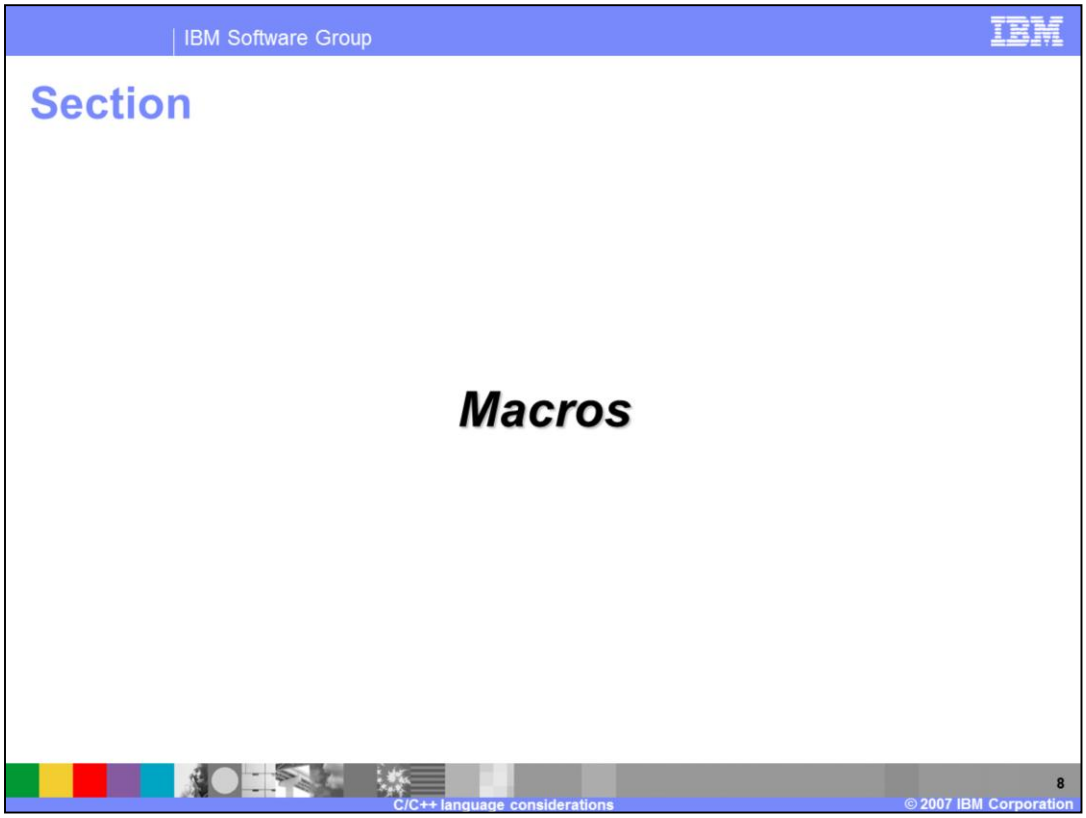


This section covers _LP64 and __ptr32.

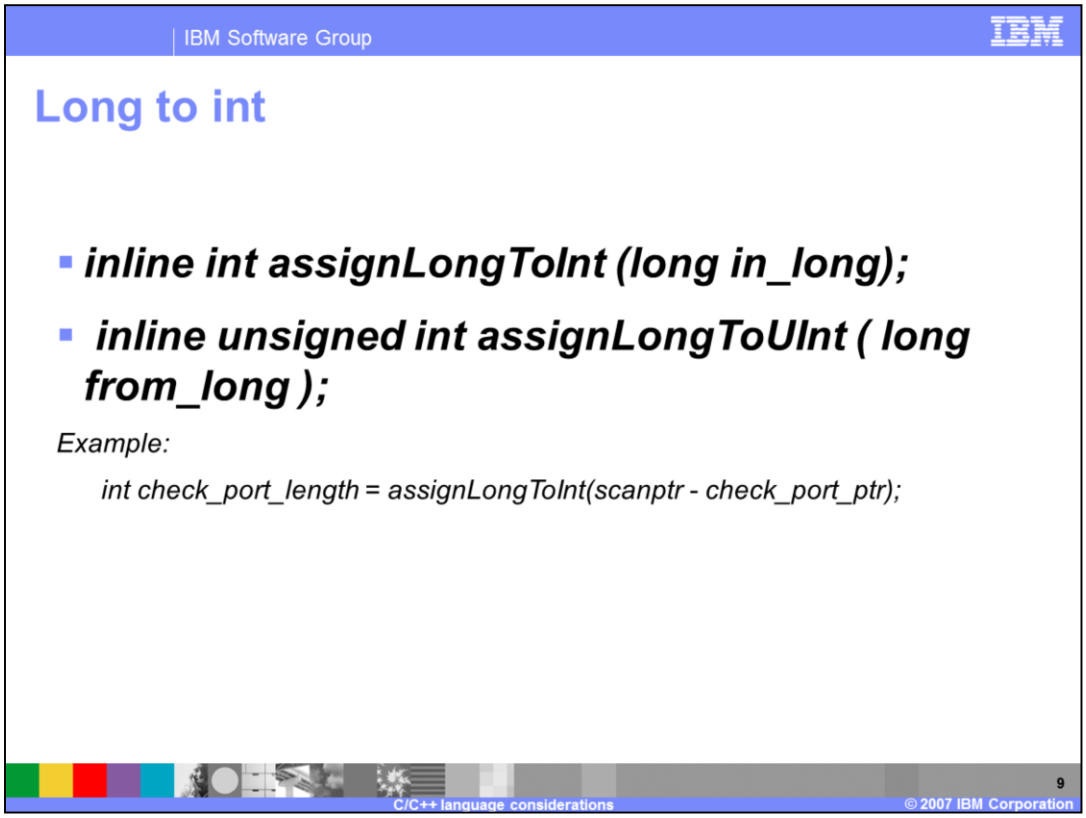


_LP64 is a compiler-provided directive that allows 64-bit code to be separated from 31-bit code in common source code through the use of #ifdef.

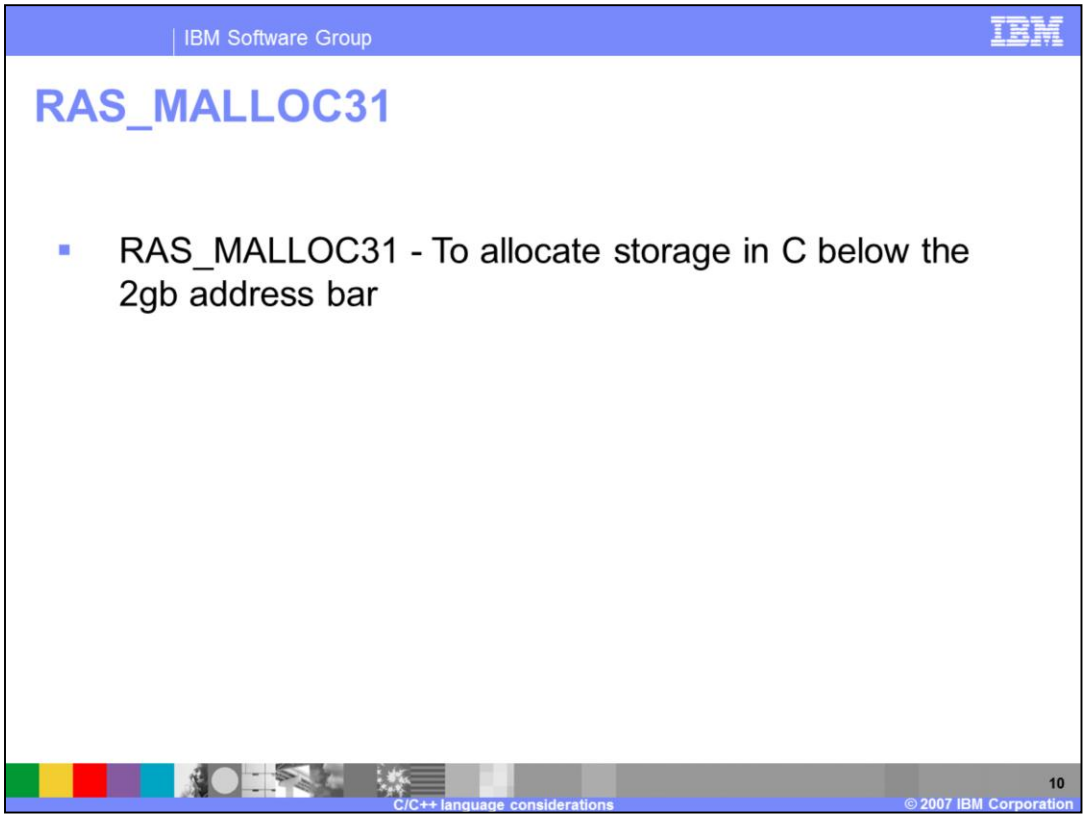
The __ptr32 attribute is used to make the pointer datatype 4 bytes under 64-bit compile mode. This is useful in cases where storage is obtained under the 2 gigabyte address bar and the address must be stored in the 64-bit runtime for PLX to manipulate later. This option is ignored in 31-bit compile mode.



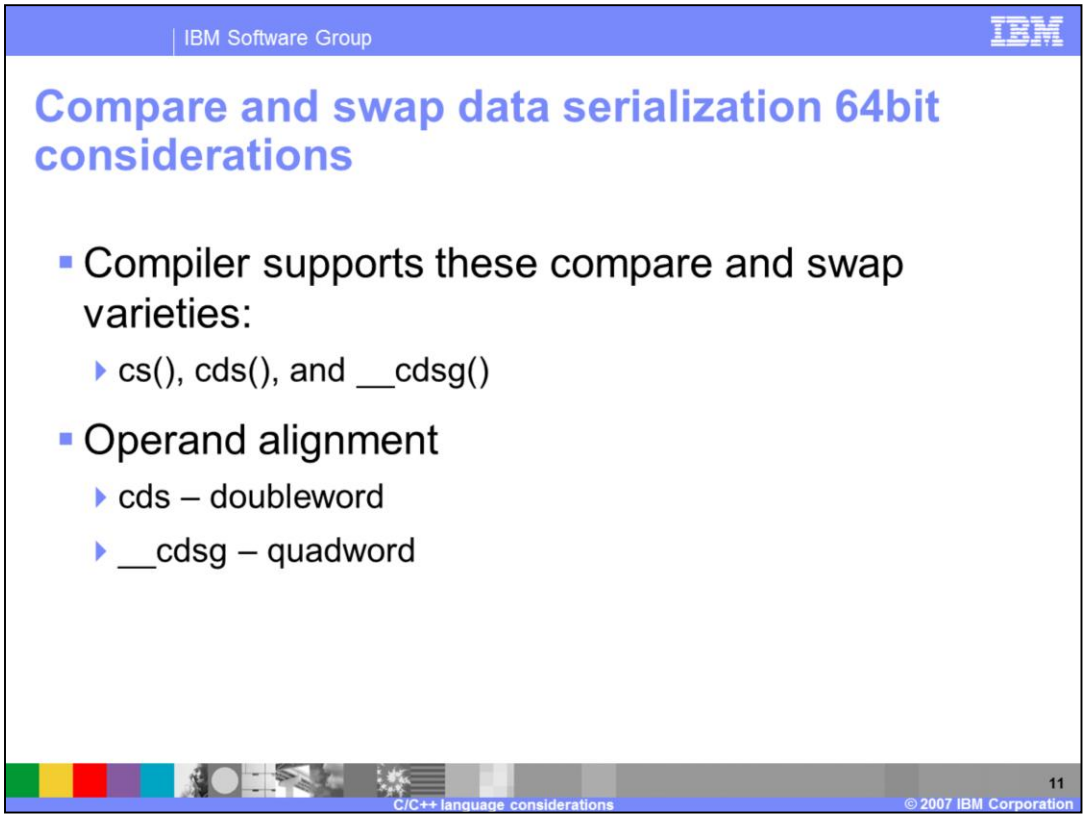
This section covers macros.



Pointer arithmetic is required in native code to calculate length or size. When the calculated value fits in a 4 byte data type, which is true in most cases, the data can be stored as an int. However, 64-bit pointers are 8 bytes and normally the difference of two pointers can not be stored into an int directly due to a compiler limitation. For this reason, the above macros are added to ensure 31-bit / 64-bit code consistency. If the difference between the two pointer values is too big to fit in a 4byte field or the value is negative an exception is thrown.

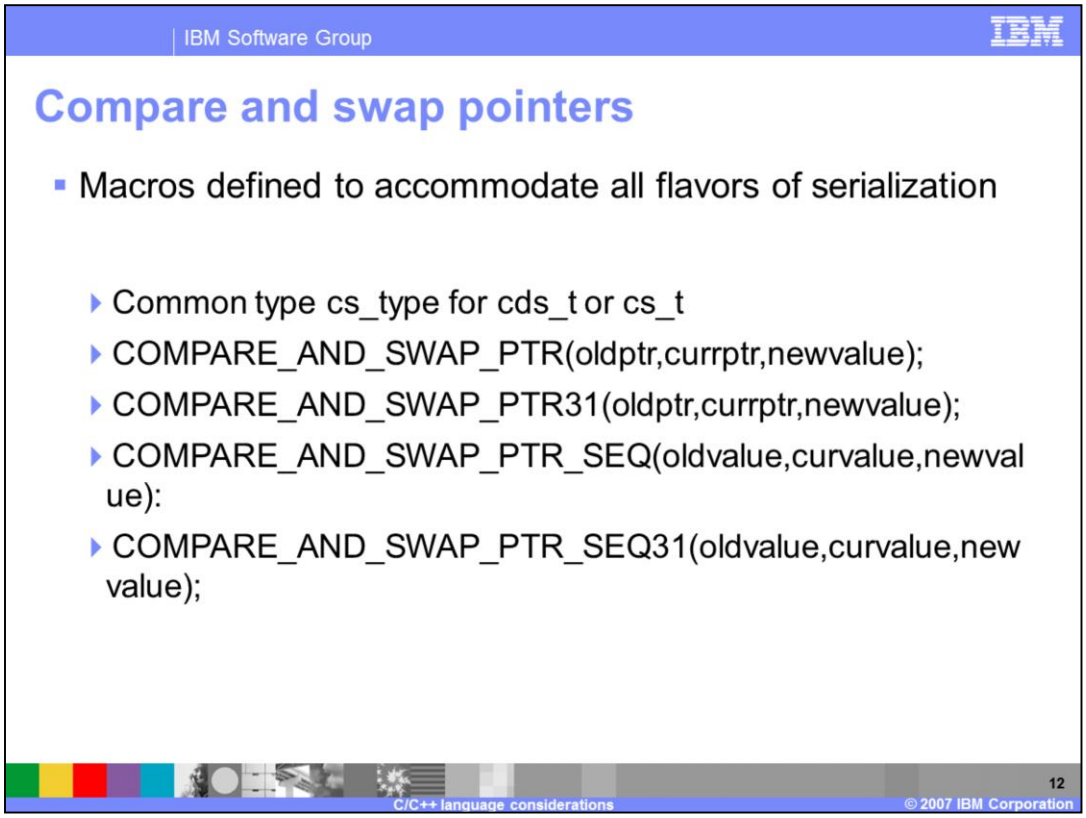


PLX code runs in 31-bit mode under a 64-bit WebSphere Application Server V6.1 runtime. To pass data between 64-bit C/C++ storage to PLX, storage must be allocated in C/C++ below the 2 gigabyte address bar so PLX can manipulate them and this macro is provided for this purpose.



In general, the compiler supports the compare and swap commands (shown above) for 4, 8, and 16 byte operands. Cds() and __cdsg() require that the operand be double word and quad word aligned.

To keep native code common between 31-bit and 64-bit processing, a variety of macros are provided to keep these operations consistent.



The macros are as follows:

1. COMPARE_AND_SWAP_PTR (old pointer, current pointer, new value) is provided to comply with compile mode for 4 or 8-byte pointers.

2. COMPARE_AND_SWAP_PTR31(old pointer, current pointer, new value) is used on 4 byte addresses regardless of bit mode

3. COMPARE_AND_SWAP_PTR_SEQ(old value, current value, new value) is used where an 8-byte pointer and 8-byte sequence number is used

4. COMPARE_AND_SWAP_PTR_SEQ31(old value, current value, new value) is used where a 4-byte pointer and a 4-byte sequence number is used regardless of mode.

cs_type is a common type created for cds_t or cs_t so code can expand based on compile mode.

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