Exploring Typed Arrays

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Defining Typed Arrays

Typed Arrays

Array-like objects that provide a mechanism for accessing raw binary data.

Benefits of Typed Arrays

Accessing raw binary data

Faster performance

Strictly controlled data

APIs that support Typed Arrays

Interacting with Native APIs

WebGL	Canvas	Web Audio API
XMLHttpRequests	Fetch API	Web Sockets
Web Workers	Media Source API	File APIs

Typed Array Structure

Array Buffer
(16 bytes)

Typed Array Structure

UInt8Array	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	1 byte each

Array Buffer (16 bytes)

UInt16Array	0	1	2	3	4	5	6	7	2 byte each
UInt32Array	0		1		2		3		4 byte each
Float64Array	0				1				8 byte each
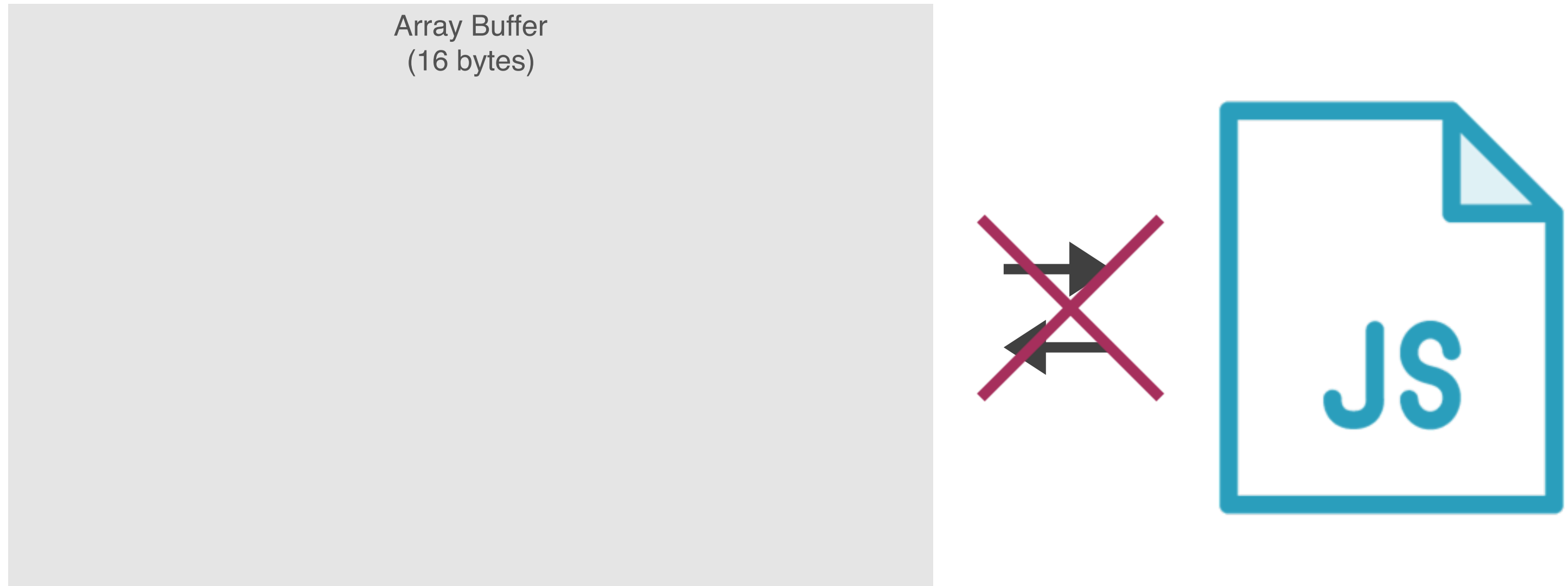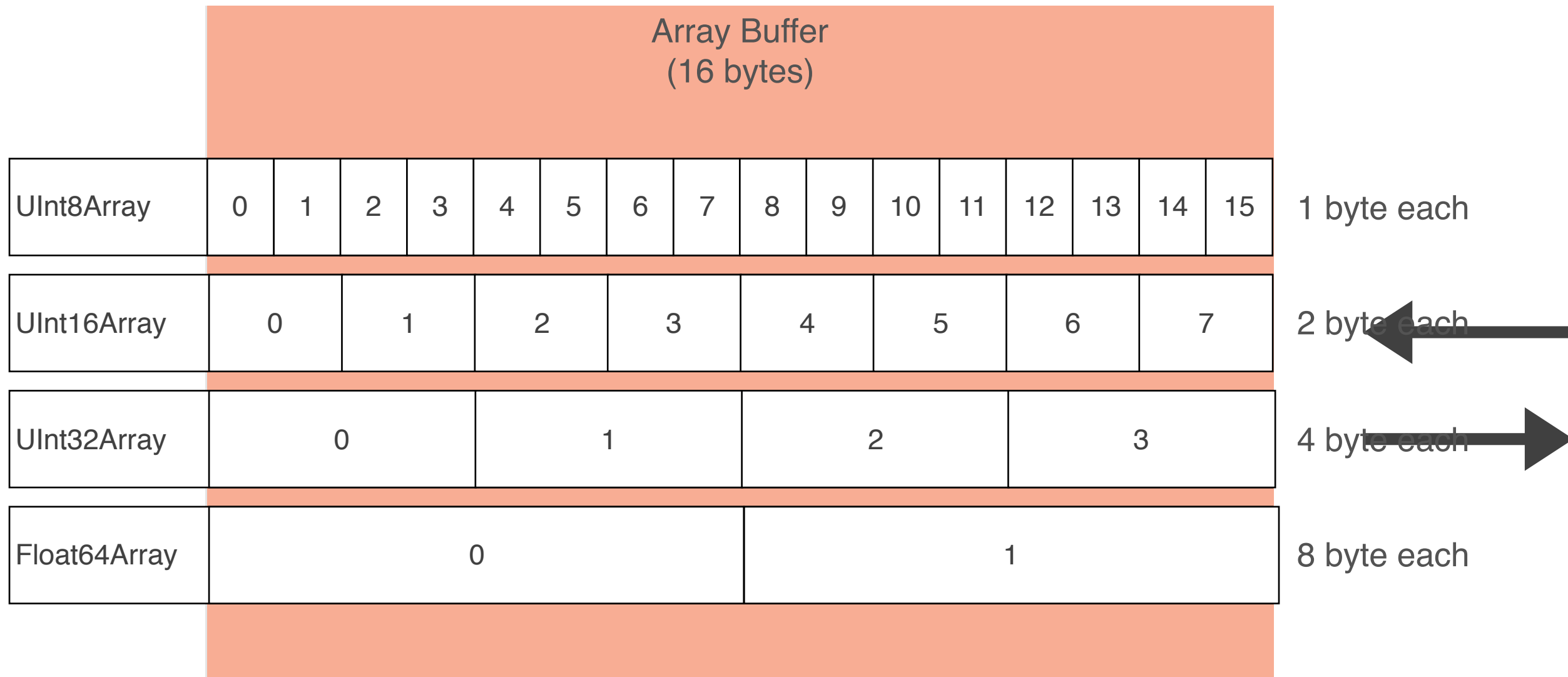
Typed Array Size and Position
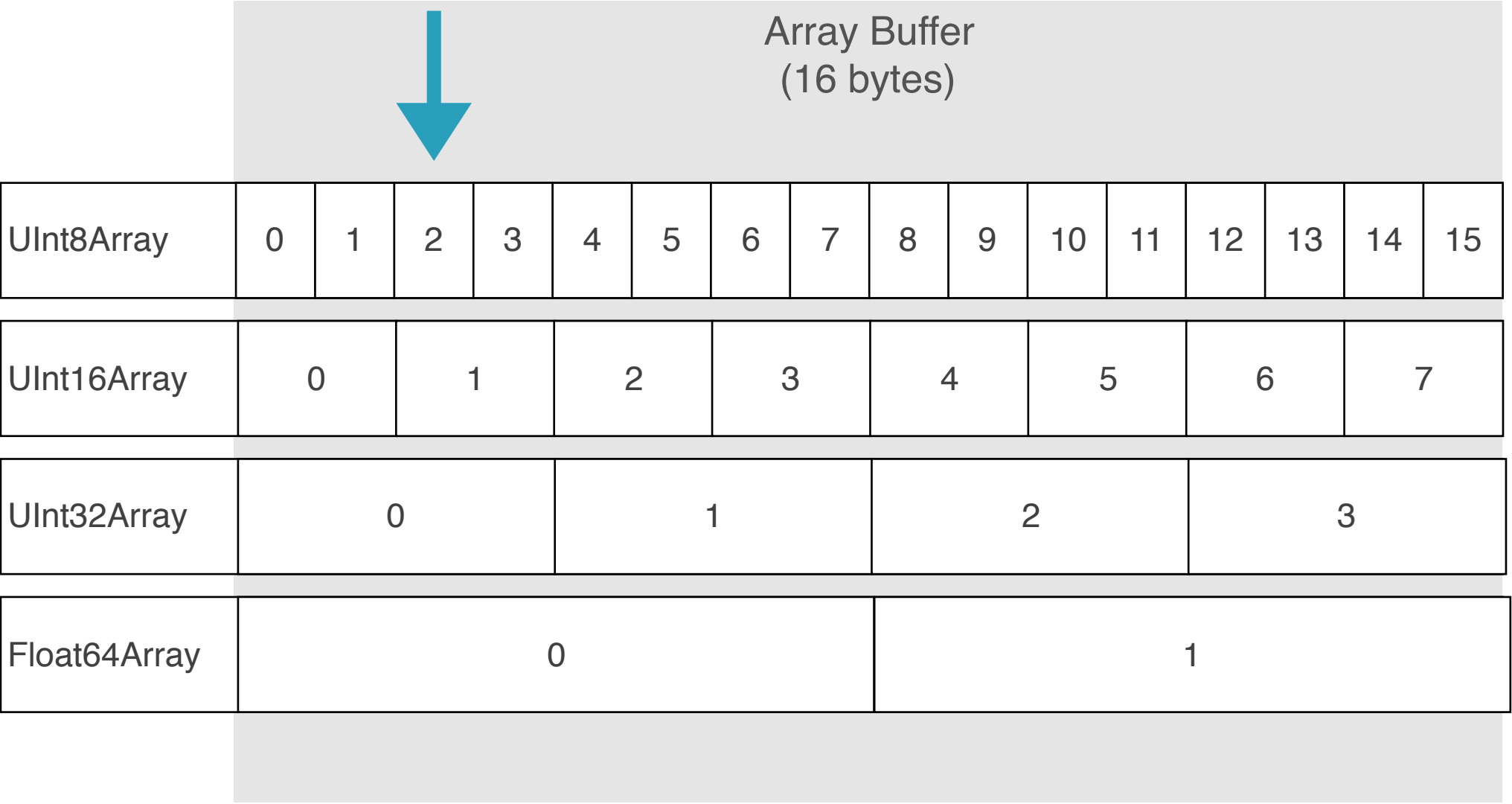
Typed Array Views

Type	Value Range	Size in Bytes	Description
Int8Array	-128 to 127	1	8-bit two's complement signed integer
Uint8Array	0 to 255	1	8-bit unsigned integer
Uint8ClampedArray	0 to 255	1	8-bit unsigned integer (clamped)
Int16Array	-32768 to 32767	2	16-bit two's complement signed integer
Uint16Array	0 to 65535	2	16-bit unsigned integer
Int32Array	-2147483648 to 2147483647	4	32-bit two's complement signed integer
Uint32Array	0 to 4294967295	4	32-bit unsigned integer
Float32Array	1.2×10^{-38} to 3.4×10^{38}	4	32-bit IEEE floating point number (7 significant digits e.g. 1.1234567)

Typed Array Views Cont'd

Type	Value Range	Size in Bytes	Description
Float64Array	5.0×10^{-324} to 1.8×10^{308}	8	64-bit IEEE floating point number (16 significant digits e.g. 1.123...15)
BigInt64Array	-2^{63} to $2^{63}-1$	8	64-bit two's complement signed integer
BigUint64Array	0 to $2^{64}-1$	8	64-bit unsigned integer

Typed Arrays vs. Standard Arrays

Standard Arrays vs. Typed Arrays

Standard Arrays	Typed Arrays
Accept most data types	Restricted data types
Standard variable storage	Binary data
Standard processing	Faster processing
	Once in view, acts like array
	Native APIs

Creating Typed Array Buffers

Accessing Typed Arrays with Views

Conclusion

Summary

Intro to typed arrays

Typed arrays vs. standard arrays

Creating array buffers

Accessing typed arrays with views