span should have size_type, not index_type

Introduction

P1227R2 changed the size and indexing operations in span from the signed type ptrdiff_t to the unsigned type size_t. The typedef should be changed from index_type to size_type to be consistent and interoperable with the rest of the standard library.

Motivation and Scope

This paper is the proposed change for a US NB comment pertaining to the C++20CD.

index_type was invented for span back when its size and indexing operations were the signed ptrdiff_t. Now that they are the unsigned size_t, the typedef should be changed from index_type to size_type to be consistent and interoperable with the rest of the standard library.
Impact on the Standard
This proposal alters the specification of `span`, which is in the C++20 CD, but it has not yet been published.

Design Decisions
Another possibility is to add `size_type` as an additional typedef. However, having two names is strictly worse than having one name, as developers will use them interchangeably. There is no reason to keep `index_type`, as it is not used by anything else in the standard library.

Technical Specifications
All changes are relative to the C++20 CD:

```cpp
template<class ElementType, size_t Extent = dynamic_extent>
class span {
    public:
        // constants and types
        using element_type = ElementType;
        using value_type = remove_cv_t<ElementType>;
        using index_type = size_t;
        using difference_type = ptrdiff_t;
        using pointer = element_type *;
        using const_pointer = const element_type *;
        using reference = element_type &;
        using const_reference = const element_type &;
        using iterator = implementation-defined;       // see [span.iterators]
        using const_iterator = implementation-defined;
        using reverse_iterator = std::reverse_iterator<iterator>;
        using const_reverse_iterator = std::reverse_iterator<const_iterator>;
        static constexpr index_type size_type extent = Extent;

        // [span.cons], constructors, copy, and assignment
        constexpr span() noexcept;
        constexpr span(pointer ptr, index_type size_type count);
        constexpr span(pointer first, pointer last);
        template<size_t N>
            constexpr span(element_type (&arr)[N]) noexcept;
        template<size_t N>
            constexpr span(array<value_type, N>& arr) noexcept;
        template<size_t N>
            constexpr span(const array<value_type, N>& arr) noexcept;
        template<class Container>
            constexpr span(Container& cont);
```
template<class Container>
    constexpr span(const Container& cont);
    constexpr span(const span& other) noexcept = default;

template<class OtherElementType, size_t OtherExtent>
    constexpr span(const span<OtherElementType, OtherExtent>& s) noexcept;

~span() noexcept = default;

constexpr span& operator=(const span& other) noexcept = default;

// [span.sub], subviews
template<size_t Count>
    constexpr span<element_type, Count> first() const;

template<size_t Count>
    constexpr span<element_type, Count> last() const;

template<size_t Offset, size_t Count = dynamic_extent>
    constexpr span<element_type, see below> subspan() const;

constexpr span<element_type, dynamic_extent> first(index_type size_type count) const;
constexpr span<element_type, dynamic_extent> last(index_type size_type count) const;
constexpr span<element_type, dynamic_extent> subspan(index_type size_type offset, index_type size_type count = dynamic_extent) const;

// [span.obs], observers
constexpr index_type size_type size() const noexcept;
constexpr index_type size_type size_bytes() const noexcept;
[[nodiscard]] constexpr bool empty() const noexcept;

// [span.elem], element access
constexpr reference operator[](index_type size_type idx) const;
constexpr reference front() const;
constexpr reference back() const;
constexpr pointer data() const noexcept;

// [span.iterators], iterator support
constexpr iterator begin() const noexcept;
constexpr iterator end() const noexcept;
constexpr const_iterator cbegin() const noexcept;
constexpr const_iterator cend() const noexcept;
constexpr reverse_iterator rbegin() const noexcept;
constexpr reverse_iterator rend() const noexcept;
constexpr const_reverse_iterator crbegin() const noexcept;
constexpr const_reverse_iterator crend() const noexcept;

friend constexpr iterator begin(span s) noexcept { return s.begin(); }
friend constexpr iterator end(span s) noexcept { return s.end(); }
private:
    pointer data_;    // exposition only
    index_type size_;  // exposition only
};

[span.cons]

constexpr span(pointer ptr, index_type size_type count);
Expects: [ptr, ptr + count) is a valid range.
Effects: Constructs a span that is a view over the range [ptr, ptr + count).
Ensures: size() == count && data() == ptr.
Throws: Nothing.

[span.sub]

constexpr span<element_type, dynamic_extent> first(index_type size_type count) const;
Expects: count <= size() is true.
Effects: Equivalent to: return {data(), count};

constexpr span<element_type, dynamic_extent> last(index_type size_type count) const;
Expects: count <= size() is true.
Effects: Equivalent to: return {data() + (size() - count), count};

constexpr span<element_type, dynamic_extent> subspan(index_type size_type offset, index_type size_type count = dynamic_extent) const;
Expects:
    offset <= size() && (count == dynamic_extent || offset + count <= size())
is true.
Effects: Equivalent to:
    return {data() + offset, count == dynamic_extent ? size() - offset : count};

[span.obs]

constexpr index_type size_type size() const noexcept;
Effects: Equivalent to: return size_;

constexpr index_type size_type size_bytes() const noexcept;
Effects: Equivalent to: return size() * sizeof(element_type);
constexpr reference operator[](index_type size_type idx) const;
Expects: idx < size() is true.
Effects: Equivalent to: return *(data() + idx);

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References
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