SDH Frame Structure

The STM-1 frame is the basic transmission format for SDH. The frame lasts for 125 microseconds, therefore, there are 8000 frames per second.

The STM-1 frame consists of overhead plus a virtual container capacity (see Figure 2). The first nine columns of each frame make up the Section Overhead, and the last 261 columns make up the Virtual Container (VC) capacity. The VC plus the pointers (H1, H2, H3 bytes) is called the AU (Administrative Unit).

Carried within the VC capacity, which has its own frame structure of nine rows and 261 columns, is the Path Overhead and the Container (see Figure 3). The first column is for Path Overhead; it's followed by the payload container, which can itself carry other containers.

Virtual Containers can have any phase alignment within the Administrative Unit, and this alignment is indicated by the Pointer in row four, as described later in the Pointers section. Within the Section Overhead, the first three rows are used for the Regenerator Section Overhead, and the last five rows are used for the Multiplex Section Overhead.

The STM frame is transmitted in a byte-serial fashion, row-by-row, and is scrambled immediately prior to transmission to ensure adequate clock timing content for downstream regenerators.

Virtual Container

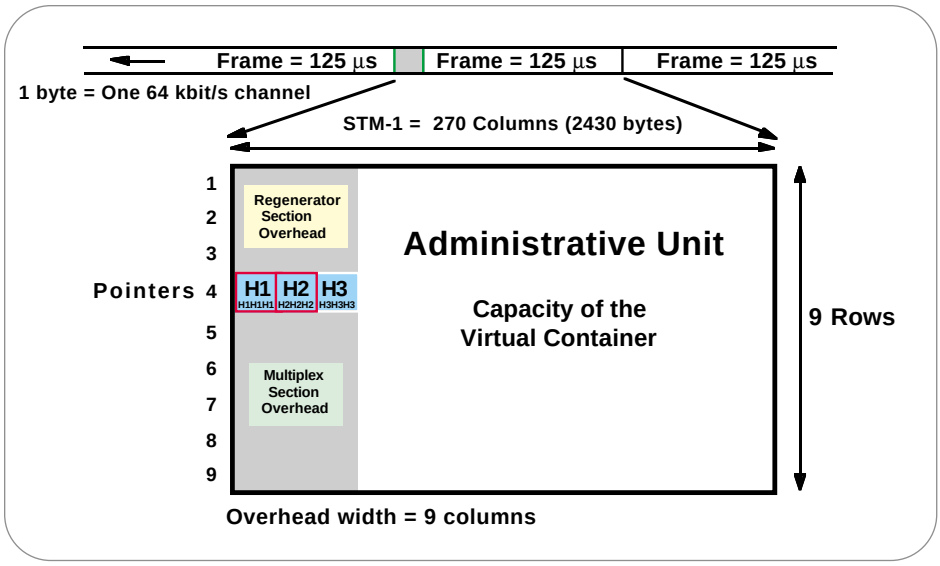
SDH supports a concept called virtual containers (VC). Through the use of pointers and offset values, VCs can be carried in the SDH payload as independent data packages. VCs are used to transport lower-speed tributary signals. Figure 3 illustrates the location of a VC-4 within the STM-1 frame. Note that it can start (indicated by the J1 path overhead byte) at any point within the STM-1 frame. The start location of the J1 byte is indicated by the pointer byte values.

Virtual containers can also be concatenated to provide more capacity in a flexible fashion.

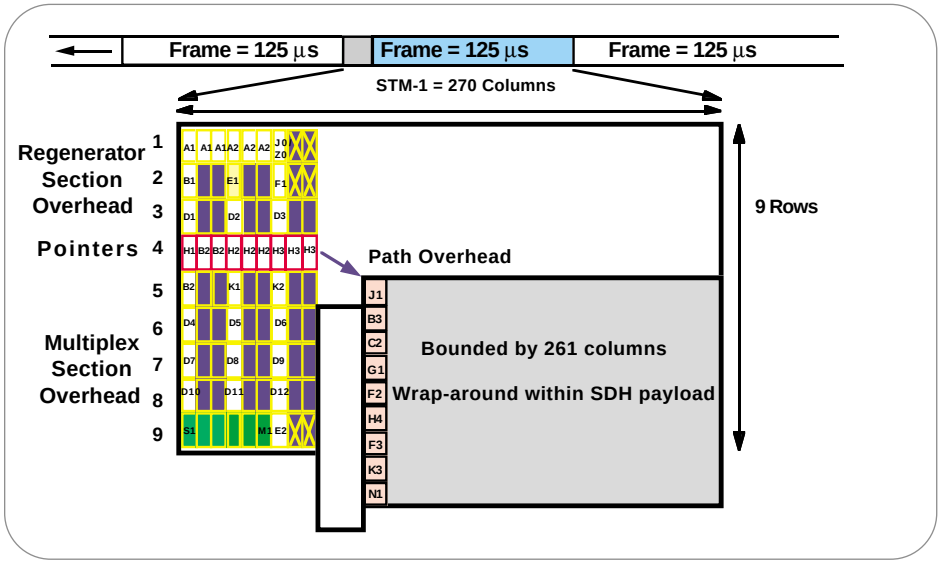
Table 3 lists the names and some of the parameters of the virtual containers.

Table 3. Virtual Containers (VC)

SDH	Digital Bit Rate	Size of VC
VC-11	1.728 Mbit/s	9 rows, 3 columns
VC-12	2.304 Mbit/s	9 rows, 4 columns
VC-2	6.912 Mbit/s	9 rows, 12 columns
VC-3	48.960 Mbit/s	9 rows, 85 columns
VC-4	150.336 Mbit/s	9 rows, 261 columns



▶ ***Figure 2.*** *STM-1 frame structure.*



▶ ***Figure 3.*** *Virtual container structure showing VC-4.*