



1. A bracket for managing cables, comprising: a u-shaped body having an open end, closed end, and two side legs; a pair of first projections extending from surfaces of the side legs towards an interior of the bracket located between the two side legs, with each of the first projections extending from a different side leg; a pair of second projections extending from the two side legs towards the interior of the bracket, each of the second projections spaced away from the closed end of the bracket and extending from a different side leg, and the pair of first projections is located closer to the open end of the bracket than the pair of second projections; a plurality of small clips disposed on an outer surface of each of the two side legs, each of the plurality of small clips configured for holding a first portion of a cable furcation point; and a plurality of large clips disposed on the outer surface of the two side legs, each of the large clips configured for holding a second portion of the cable furcation point.
2. The bracket of claim 1, wherein the plurality of small clips are disposed at a first vertical position of the u-shaped body, a first portion of the plurality of large clips is disposed at a second vertical position of the u-shaped body, and another portion of the plurality of large clips is disposed at a third vertical position of the u-shaped body, wherein vertical refers to a direction normal to the lengths the side legs.
3. The bracket of claim 1, wherein the plurality of large clips alternate along the lengths of the side legs between being positioned at the second vertical position and the third vertical position.
4. The bracket of claim 1, wherein each of the plurality of small clips is vertically aligned to a respective large clip.
5. The bracket of claim 1, wherein the closed end of the u-shaped body comprises a curved surface concave to an interior of the bracket.
6. The bracket of claim 1, wherein the closed end of the u-shaped body is configured for routing cables along a length of a spine bar of a computer cabinet.
7. The bracket of claim 6, wherein the bracket can affix to the spine bar using a single first projection.
8. The bracket of claim 1, wherein the first side leg is spaced from the second side leg by about the width of a main frame computer spine bar.
9. The bracket of claim 1, wherein the first projections are longer vertically than the second projections.
10. The bracket of claim 1, further comprising: a pair of third projections, each of the third projections positioned on a surface of one of the two side legs, vertically aligned with one of the second projections.
11. The bracket of claim 1, each of the plurality of small clips comprises a pair of straight opposing prongs that are sufficiently flexible or rigid, shaped and sized to securely hold the first portion of the cable furcation point.
12. The bracket of claim 1, each of the plurality of large clips comprises a pair of curved opposing prongs that are sufficiently flexible or rigid, shaped and sized to securely hold the second portion of the cable furcation point.
13. A system for managing cables, comprising: a plurality of brackets of claim 1; and a computer cabinet for storing a plurality of computing devices having network ports therein, the computer cabinet comprising a spine bar, wherein the plurality of brackets are reversibly attached to the spine bar and wherein each of the plurality of brackets is configured to fasten a plurality of cables along a length of the spine bar.
14. The system of claim 13, wherein the spine bar comprises a plurality of slots wherein each of the plurality of slots is configured for snapping in a pair of first projections from a bracket of the plurality of brackets.



and data centers.

## SUMMARY

[0002] At least one aspect of the disclosure is directed to a bracket for managing cables. The bracket includes a u-shaped body having an open end, closed end, and two side legs. The bracket also includes a pair of first projections extending from surfaces of the side legs towards an interior of the bracket located between the two side legs, with each of the first projections extending from a different side leg. The bracket further includes a pair of second projections extending from the two side legs towards the interior of the bracket, each of the second projections spaced away from the closed end of the bracket and extending from a different side leg, and the pair of first projections is located closer to the open end of the bracket than the pair of second projections. The bracket also includes a plurality of small clips disposed on an outer surface of each of the two side legs, each of the plurality of small clips configured for holding a first portion of a cable furcation point, and a plurality of large clips disposed on the outer surface of the two side legs, each of the large clips configured for holding a second portion of the cable furcation point.

[0003] In some embodiments, the plurality of small clips are disposed at a first vertical position of the u-shaped body, a first portion of the plurality of large clips is disposed at a second vertical position of the u-shaped body, and another portion of the plurality of large clips is disposed at a third vertical position of the u-shaped body, wherein vertical refers to a direction normal to the lengths the side legs. In some embodiments, the plurality of large clips alternate along the lengths of the side legs between being positioned at the second vertical position and the third vertical position. In some embodiments, each of the plurality of small clips is vertically aligned to a respective large clip.

[0004] In some embodiments, the closed end of the u-shaped body comprises a curved surface concave to an interior of the bracket. In some embodiments, the closed end of the u-shaped body is configured for routing cables along a length of a spine bar of a computer cabinet. In some embodiments, the bracket can affix to the spine bar using a single first projection. In some embodiments, the first side leg is spaced from the second side leg by about the width of a main frame computer spine bar. In some embodiments, the first projections are longer vertically than the second projections.

[0005] In some embodiments, the bracket further includes a pair of third projections, each of the third projections positioned on a surface of one of the two side legs, vertically aligned with one of the second projections. In some embodiments, each of the plurality of small clips includes a pair of straight opposing prongs that are sufficiently flexible or rigid, shaped and sized to securely hold the first portion of the cable furcation point. In some embodiments, each of the plurality of large clips includes a pair of curved opposing prongs that are sufficiently flexible or rigid, shaped and sized to securely hold the second portion of the cable furcation point.

[0006] At least one aspect of the disclosure is directed to a system for managing cables. The system includes a plurality of brackets as described herein and a computer cabinet for storing a plurality of computing devices having network ports therein. In some implementations, the computer cabinet includes a spine bar. In some embodiments, the plurality of brackets are reversibly attached to the spine bar. In some embodiments, each of the plurality of brackets is configured to fasten a plurality of cables along a length of the spine bar.

[0007] In some embodiments, the spine bar includes a plurality of slots wherein each of the plurality of slots is configured for snapping in a pair of first projections from a bracket of the plurality of brackets. In some embodiments, the plurality of brackets are attached to the spine bar along the length of the spine bar at different vertical heights from a bottom of the cabinet.

[0008] In some embodiments, at least one of the plurality of brackets includes a plurality of cable furcation points clipped into an exterior surface of the bracket and a plurality of cables routed through an interior space of the bracket located between the spine bar and the computing devices in the cabinet, where each of the cables in the interior space includes a furcation point clipped into at least one of the other brackets. In some embodiments,



[0017] FIG. 1D shows a perspective view of the bracket attached to a spine bar, according to an illustrative implementation;

[0018] FIG. 1E shows a top-down view of the bracket attached to the spine bar, according to an illustrative implementation;

[0019] FIG. 2A illustrates a system for managing cables using a bracket, according to illustrative implementations;

[0020] FIG. 2B illustrates a system for managing cables using a plurality of brackets, according to illustrative implementations;

[0021] FIG. 3 is a flowchart for an example method of assembling a system for managing cables, according to an illustrative implementation.

## DETAILED DESCRIPTION

[0022] It is to be understood that the following disclosure provides many different embodiments, or examples, for implementing different features of the disclosure. Specific embodiments or examples of components and arrangements are described below to simplify the present disclosure. These are, of course, merely examples and are not intended to be limiting. For example, dimensions of elements are not limited to the disclosed range or values, but may depend upon process conditions and/or desired properties of the device. Moreover, the formation of a first feature over or on a second feature in the description that follows may include embodiments in which the first and second features are formed in direct contact, and may also include embodiments in which additional features may be formed interposing the first and second features, such that the first and second features may not be in direct contact. Various features may be arbitrarily drawn in different scales for simplicity and clarity.

[0023] Further, spatially relative terms, such as "beneath," "below," "lower," "above," "upper" and the like, may be used herein for ease of description to describe one element or feature's relationship to another element(s) or feature(s) as illustrated in the figures. The spatially relative terms are intended to encompass different orientations of the device in use or operation in addition to the orientation depicted in the figures. The device may be otherwise oriented (rotated 180 degrees or at other orientations) and the spatially relative descriptors used herein may likewise be interpreted accordingly. In addition, the term "made of" may mean either "comprising" or "consisting of."

[0024] The disclosure as described herein relates to a bracket and a system including a plurality of brackets mounted to a spine bar of computer cabinet or a computer storage structure that houses a plurality of computing devices, such as computers, mainframe computers, or one or more servers or server racks in a network environment. In such environments, the computing devices are connected via cables, such as, Ethernet cables or fiber optics cables, to form the computing network within the network or externally to other networks. The computing devices in a given computer cabinet are typically connected to a central networking device such as a hub or top-of-rack switch, which may be located on the top, at the bottom, or elsewhere in or on the computer cabinet. This central networking device serves as a point of contact to a remainder of the computer network and to route communications between computing devices housed in the computer cabinet. To properly manage the cables within a network or even within a computer cabinet that contains a plurality of computing devices, the cables coupled to the computing devices can be routed to the central computing device along a spine bar of the cabinet.

[0025] To ease the cabling burden, cables are often provided in cable harnesses that include a trunk portion and a plurality of legs. The trunk portion includes all of the cables that make up the harness within a single jacket, whereas the legs contain one or in some cases two cables within separate jackets. For example, a cable harness may include 16 optical fibers under a common jacket in the trunk portion, split up into 8 fiber pairs in 8 separate

legs. In some implementations the trunk of the cable harness may include 32 optical fibers, which split into 16 fiber pairs in 16 separate legs. Other numbers of fibers or other types of cables or wires can be included in the cable harness without departing from the scope of the disclosure.

[0026] The point at which the trunk splits into its legs is referred to as a furcation point. The furcation point includes a neck portion that receives the trunk of the cable harness. The furcation point then broadens at a shoulder portion, where the trunk is split into its separate legs, into a body portion, which includes a jacket that surrounds all of the jacketed legs for a short distance. The diameter of the body portion of the furcation point can range between 1.5-3.0 times the diameter of the neck of the furcation point. Outside of the body jacket of the furcation point, each of the legs of the cable harness can be individually routed to its respective network port or ports. In some implementations, the neck of the furcation point can range from about 0.25 cm to 1.0 cm in length and the body of the furcation point can range from about 1.0 cm to about 5 cm in length.

[0027] To provide for organized and stable cabling routing, it can be beneficial for the furcation point of a cable harness to be releasably fixed in position. This releasably fixed position prevents changes in orientation of the furcation point that could damage the cables at the furcation point. It also keeps maintains the division of the cabling harness at a desired location, e.g., relatively close to the network ports each of the legs will couple too, facilitating easy identification of correspondence between cable legs, cable trunks, and computer devices.

[0028] Accordingly, the disclosure as described herein relates to a bracket for managing cables, a system for managing cables, and a method for assembling a system for managing cables. In some implementations, the cables refer to fiber optics cables, Ethernet cables, or any suitable cables for use in networking environments. The brackets provide fixtures for releasable fixation of cable harness furcation points, as well as for paths for routing trunk portions of cable harnesses along a computer cabinet in a neat and organized fashion.

[0029] Various implementations of the bracket, system, and method disclosed herein employ a u-shaped body having an open end, a closed end, and two side legs. In some embodiments, the disclosed bracket includes a pair of first projections extending from surfaces of the side legs towards an interior of the bracket located between the two side legs. The brackets also can include a pair of second projections extending from the two side legs towards the interior of the bracket. Each of the second projections is spaced away from the closed end of the bracket and extends from a different side leg, and the pair of first projections is located closer to the open end of the bracket than the pair of second projections. The first projections can be used to secure the bracket into slots formed in various positions along the length of a computer cabinet spine bar. The second projections are positioned to abut the computer device-facing side of the spine bar, to help avoid rotation of the bracket and to facilitate proper placement of the bracket on the spine bar. The space between the second projections and the closed end of the bracket can be used to route trunk portions of cable harnesses that have furcation points at other locations in the computer cabinet.

[0030] In some embodiments, the bracket also includes a plurality of large clips for releasably receiving body portions of respective cable harness furcation points. The bracket also includes small clips disposed on an outer surface of each of the two side legs to receive the necks of the furcation points. The small clips help prevent the furcation points being pulled out of the brackets along the length of the spine bar while the cables are being routed. In some embodiments, each of the plurality of small clips of the bracket includes a pair of straight opposing prongs that are sufficiently flexible or rigid, shaped and sized to hold the first portion of the cable furcation point and prevent movement of a furcation point along at least one vertical direction. In some embodiments, each of the plurality of large clips of the bracket includes a pair of curved opposing prongs that are sufficiently flexible or rigid, shaped and sized to securely hold the second portion of the cable furcation point.

[0031] In some embodiments, the plurality of small clips of the disclosed bracket are disposed at a first vertical position of the u-shaped body of the bracket. The "vertical position" as used herein refers to a direction normal to the lengths of the side legs of the brackets. A first portion of the plurality of large clips can be disposed at a second vertical position of the u-shaped body, and another portion of the plurality of large clips is disposed at a third vertical position of the u-shaped body. In some embodiments, the vertical positions of the plurality of large











principles and the novel features disclosed herein.

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