

EXHIBIT A

EXHIBIT A: Agreed and Disputed Claim Constructions

PATENT CLAIM TERMS FOR CONSTRUCTION

'986, '279, '394 and '637 Patents

AGREED CONSTRUCTIONS			
Claim Language / Claim Term	Plaintiff's Proposed Construction	Defendant's Proposed Construction	Court's Construction
'986 Patent, Claims 1, 12, 13, 16, 19, 24 “failure associated with the first link” 1. A method for network communication, comprising: coupling an edge switch in a network to one or more access switches via at least first and second redundant links, respectively connected to first and second ports of the edge switch; placing the first port in an active state, while placing the second port in a blocking state; conveying communication traffic over the first link while the first port is in the active state, thereby causing each of the switches to build a respective database for use in forwarding the traffic; responsive to a failure associated with the first link, placing the second port in the active state and the first port in the blocking state; and sending dummy traffic from the edge switch over the second link to the one or more access switches, so as to cause each of the one or more access switches to modify its respective database responsive to the second port being in the active state.	[AGREED]	[AGREED]	“fault in the first link itself or in one of the ports to which the first link is connected”

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12. A method for network communication, comprising: coupling a first bridge in a network to a second bridge located downstream of the first bridge, by connecting at least first and second redundant links to respective first and second ports of the first bridge so as to communicate with the second bridge; placing the first port in an active state, while placing the second port in a blocking state; conveying communication traffic over the first link while the first port is in the active state, thereby causing the bridges to build respective databases for use in forwarding the traffic; responsive to a failure associated with the first link, placing the second port in the active state and the first port in the blocking state; and sending dummy traffic from the first bridge over the second link downstream to the second bridge, so as to cause the second bridge to modify its database responsive to the second port being in the active state. 13. A network switching device, comprising: a network port, adapted to be coupled over a network trunk link to a core switch in a network so as to exchange communication traffic with the core switch;			

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first and second access ports, adapted to be coupled via first and second redundant network access links to one or more access switches serving network users; and a protocol processor, adapted to place the first access port in an active state, while placing the second access port in a blocking state, so that the communication traffic is conveyed over the first link while the first port is in the active state, thereby causing each of the access switches to build a respective access switch database for use in forwarding the traffic, the protocol processor being further adapted, responsive to a failure associated with the first link, to place the second access port in the active state and the first port in the blocking state and to send dummy traffic through the second access port over the second link to the one or more access switches, so as to cause each of the one or more access switches to modify its respective access switch database responsive to the second access port being in the active state. 16. A device according to claim 13, and comprising a memory, wherein the protocol processor is adapted to build an edge switch database in the memory responsive to the communication traffic prior to the failure associated with the first link and, responsive to placing the second access port in the			

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active state, to update the edge switch database so that entries in the edge switch database point to the second access port instead of the first access port. 19. A device according to claim 18, and comprising a memory, wherein the protocol processor is adapted to build an edge switch database in the memory responsive to the communication traffic prior to the failure associated with the first link, and to copy the source addresses for the data frames from the edge switch database. 24. A bridge device for use in a communication network having a spanning tree root, the device comprising: a designated port, adapted to be coupled over an upstream link in the network so as to communicate with the root; first and second downstream ports, adapted to be coupled via first and second redundant links to a further bridge device located downstream in the network relative to the spanning tree root; and a protocol processor, which is adapted to place the first downstream port in an active state, while placing the second downstream port in a blocking state, so that communication traffic is conveyed over the first downstream link while the first port is in the active state, thereby causing the bridge devices to			

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build respective databases for use in forwarding the traffic, the protocol processor being further adapted, responsive to a failure associated with the first link , to place the second downstream port in the active state and to send dummy traffic over the second link downstream to the further bridge device, so as to cause the further bridge device to modify its database responsive to the second downstream port being in the active state.			
'279 Patent, Claims 1, 15 “quanta” 1. In a communication network that includes a plurality of nodes interconnected by links, the nodes including at least first and second nodes, a method for routing a data flow, comprising: allocating a respective number of quanta of one or more resources in the network to each of the nodes; receiving a request at the first node to use a portion of the resources so as to carry the data flow between the first and second nodes over one of a plurality of paths therebetween, each such path comprising a respective sequence of the links; and in response to the request: if the resources already allocated to the first node on one of the paths are sufficient, directing the data flow from the first node to the second node over the	[AGREED]	[AGREED]	“more than one quantum”

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one of the paths without requesting additional resources; and if the resources already allocated to the first node are insufficient, performing the following steps: requesting an increase in an allocation to the first node of the requested resources; determining, for the links comprised by each of the paths, respective levels of use of the requested resources due to communications in progress over the network; selecting which of the paths is to carry the data flow responsive to the determined levels of use of the requested resources on the links comprised in each of the paths; and increasing the allocation of the resources to the first node on the selected path by a predetermined quantum. 15. A communication network, comprising: a plurality of nodes, comprising at least first and second nodes; a plurality of links, interconnecting the nodes to provide communications therebetween; and a dispatcher, which is adapted to allocate a respective number of quanta of one or more resources in the network to each of the nodes, wherein the first node is adapted, upon receiving a request to use a portion of the resources so as to			

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carry the data flow between the first and second nodes over one of a plurality of paths therebetween, each such path comprising a respective sequence of the links, to direct the data flow from the first node to the second node over one of the paths without requesting additional resources if the resources already allocated to the first node on the one of the paths are sufficient, and to request an increase in an allocation of the requested resources to the first node if the resources already allocated to the first node are insufficient, and wherein in response to the increase requested by the first node, the dispatcher is adapted to determine, for the links comprised in each of the paths, respective levels of use of the requested resources due to communications in progress over the network and to select which of the paths is to carry the data flow responsive to the determined levels of use of the requested resources on the links comprised in each of the paths, and to increase the allocation of the resources to the first node on the selected path by a predetermined quantum.			
'394 Patent, Claims 1, 5, 11, 15 “a high-capacity port” 1. A method for communication, comprising: operating a network element, wherein the network element further comprises multiple interconnected	[AGREED]	[AGREED]	“A port formed by aggregating two or more ports”

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processing units and multiple ports, wherein each processing unit is assigned to a different subset of the multiple ports of the network element, and wherein each processing unit contains a processor for processing packets communicated over the different subset of the multiple ports to which the processing unit is assigned; storing in each processing unit a respective list, each list indicating all of one or more multicast packet streams that are permitted for forwarding by the network element, and further indicating which of the one or more ports each multicast packet stream is permitted to be forwarded to; receiving from a client a request relating to reception of a given multicast packet stream; distributing the request among the multiple processing units within the network element, and updating the respective list in each processing unit responsively to the request; and selectively forwarding multicast packets associated with the given multicast packet stream by the processing units in accordance with the respective updated lists, wherein operating the network element comprises aggregating two or more of the ports to form a high-capacity port, and wherein aggregating the ports comprises setting an upper limit on a number of the multicast packet			

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streams that are permitted for forwarding over the high-capacity port, wherein the request indicates that the given multicast packet stream is to be forwarded over the high-capacity port, and wherein updating the list comprises modifying the list to indicate that the given multicast packet stream is permitted for forwarding over the high-capacity port only when the number of the multicast packet streams that are permitted for forwarding over the high-capacity port, including the given multicast packet stream, does not exceed the upper limit. 5. The method according to claim 1, wherein the ports forming the high-capacity port are assigned to at least two of the processing units, and wherein updating the list comprises holding respective local copies of the number of the multicast packet streams that are permitted for forwarding over the high-capacity port, updating the local copies based on the distributed request, and selectively updating the list in each of the at least two processing units based on the respective local copies. 11. A network element, comprising; multiple ports; and multiple interconnected processing units, wherein each processing unit is assigned to a different subset of the multiple ports of the network element, and			

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wherein each processing unit contains a processor for processing packets communicated over the different subset of the multiple ports to which the processing unit is assigned, wherein the processing units are configured to process packets that are communicated over respective subsets of one or more of the ports, to store respective lists, each of which indicates all of one or more multicast packet streams that are permitted for forwarding by the network element and further indicates which of the one or more ports multicast packet stream is permitted to be forwarded to, to receive from a client a request relating to reception of a given multicast packet stream, and to distribute the request among the processing units within the network element so as to update the lists responsively to the distributed request and to selectively forward multicast packets associated with the given multicast packet stream in accordance with the updated lists, wherein two or more of the ports are aggregated to form a high-capacity port, and wherein an upper limit is set on a number of the multicast packet streams that are permitted for forwarding over the high-capacity port, wherein the request indicates that the given multicast packet stream is to be forwarded over the high-capacity port, and wherein			

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the processing units are configured to update the lists to indicate that the given multicast packet stream is permitted for forwarding over the high-capacity port only when the number of the multicast packet streams that are permitted for forwarding over the high-capacity port, including the given multicast packet stream, does not exceed the upper limit. 15. The network element according to claim 11, wherein the ports forming the high-capacity port are assigned to at least two of the processing units, and wherein the at least two processing units are configured to hold respective local copies of the number of the multicast packet streams that are permitted for forwarding over the high-capacity port, to update the local copies based on the distributed request, and to selectively update their respective lists based on the respective local copies.			

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'986 Patent, Claims 1-4, 6-8, 11, 16, 19-20¹ “edge switch” 1. A method for network communication, comprising: coupling an edge switch in a network to one or more access switches via at least first and second redundant links, respectively connected to first and second ports of the edge switch; placing the first port in an active state, while placing the second port in a blocking state; conveying communication traffic over the first link while the first port is in the active state, thereby causing each of the switches to build a respective database for use in forwarding the traffic; responsive to a failure associated with the first link, placing the second port in the active state and the first port in the blocking state; and sending dummy traffic from the edge switch over the second link to the one or more access switches, so as to cause each of the one or more access switches to modify its respective database responsive to the second port being in the active state.	<u>Proposed Construction:</u> Plain and ordinary meaning OR “Switch located at the edge of a network”	<u>Proposed Construction:</u> “core switch that is directly connected to (an) access switch(es)”	

¹ The term is also found in '986 Patent Claims 14, 18, and 23. For purposes of streamlining the issues before the Court, Portsmouth has withdrawn claims 14, 18, and 23 from the Asserted Claims.

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2. A method according to claim 1, wherein placing the second port in the blocking state comprises configuring the first and second ports so that no loop is created in the network between the edge switch and the one or more access switches.			
3. A method according to claim 2, wherein configuring the first and second ports comprises configuring the edge switch so as to decrease a radius of a spanning tree established in the network.			
4. A method according to claim 1, and comprising, responsive to placing the second port in the active state, updating the database of the edge switch so that entries in the database point to the second port instead of the first port.			
6. A method according to claim 1, wherein sending the dummy traffic comprises sending data frames originating at the edge switch while having source addresses corresponding to network addresses of other entities in the network that are accessible to the access switches via the edge switch .			
7. A method according to claim 6, wherein sending the data frames comprises copying the source addresses for the data frames from the database of the edge switch .			

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8. A method according to claim 7, wherein the edge switch has three or more ports, including the first and second ports, and wherein prior to the failure, the database comprises entries associated with a plurality of the ports, and wherein copying the source addresses comprises using the network addresses in all the entries that are not associated with the first port as the source addresses of the data frames. 11. A method according to claim 1, wherein sending the dummy traffic comprises sending data frames downstream from the edge switch toward the access switches. 16. A device according to claim 13, and comprising a memory, wherein the protocol processor is adapted to build an edge switch database in the memory responsive to the communication traffic prior to the failure associated with the first link and, responsive to placing the second access port in the active state, to update the edge switch database so that entries in the edge switch database point to the second access port instead of the first access port. 19. A device according to claim 18, and comprising a memory, wherein the protocol processor is adapted			

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to build an edge switch database in the memory responsive to the communication traffic prior to the failure associated with the first link, and to copy the source addresses for the data frames from the edge switch database. 20. A device according to claim 19, wherein prior to the failure, the edge switch database comprises entries associated with a plurality of the ports, and wherein the protocol processor is adapted to use the network addresses in all the entries that are not associated with the first access port as the source addresses of the data frames.			
'986 Patent, Claims 1, 2, 5, 6, 10, 11, 13, 17, 22² “access switch” 1. A method for network communication, comprising: coupling an edge switch in a network to one or more access switches via at least first and second redundant links, respectively connected to first and second ports of the edge switch; placing the first port in an active state, while placing the second port in a blocking state;	<u>Proposed Construction:</u> Plain and ordinary meaning OR “Switch providing access to a network”	<u>Proposed Construction:</u> “switch with ports that connect to LANs and/or to other network endpoints”	

² The term is also found in '986 Patent Claims 14, 18, and 23. For purposes of streamlining the issues before the Court, Portsmouth has withdrawn claims 14, 18, and 23 from the Asserted Claims.

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conveying communication traffic over the first link while the first port is in the active state, thereby causing each of the switches to build a respective database for use in forwarding the traffic; responsive to a failure associated with the first link, placing the second port in the active state and the first port in the blocking state; and sending dummy traffic from the edge switch over the second link to the one or more access switches, so as to cause each of the one or more access switches to modify its respective database responsive to the second port being in the active state. 2. A method according to claim 1, wherein placing the second port in the blocking state comprises configuring the first and second ports so that no loop is created in the network between the edge switch and the one or more access switches. 5. A method according to claim 4, wherein updating the database comprises changing the entries in the database to point to the second port before receiving the communication traffic from the one or more access switches on the second port. 6. A method according to claim 1, wherein sending the dummy traffic comprises sending data frames			

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originating at the edge switch while having source addresses corresponding to network addresses of other entities in the network that are accessible to the access switches via the edge switch. 10. A method according to claim 6, wherein sending the data frames comprises multicasting the data frames to all of the one or more access switches. 11. A method according to claim 1, wherein sending the dummy traffic comprises sending data frames downstream from the edge switch toward the access switches. 13. A network switching device, comprising: a network port, adapted to be coupled over a network trunk link to a core switch in a network so as to exchange communication traffic with the core switch; first and second access ports, adapted to be coupled via first and second redundant network access links to one or more access switches serving network users; and a protocol processor, adapted to place the first access port in an active state, while placing the second access port in a blocking state, so that the communication traffic is conveyed over the first link while the first port is in the active state, thereby			

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causing each of the access switches to build a respective access switch database for use in forwarding the traffic, the protocol processor being further adapted, responsive to a failure associated with the first link, to place the second access port in the active state and the first port in the blocking state and to send dummy traffic through the second access port over the second link to the one or more access switches, so as to cause each of the one or more access switches to modify its respective access switch database responsive to the second access port being in the active state. 17. A device according to claim 16, wherein the protocol processor is adapted to update the entries in the database to point to the second access port before receiving the communication traffic from the one or more access switches on the second port. 22. A device according to claim 18, wherein the protocol processor is adapted to multicast the data frames to all of the one or more access switches.			
'279 Patent, Claims 1, 10, 14-16, 18 “predetermined” 1. In a communication network that includes a plurality of nodes interconnected by links, the nodes	<u>Proposed Construction:</u> Plain and ordinary meaning	<u>Proposed Construction:</u> “determined before the data flow request”	

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including at least first and second nodes, a method for routing a data flow, comprising: allocating a respective number of quanta of one or more resources in the network to each of the nodes; receiving a request at the first node to use a portion of the resources so as to carry the data flow between the first and second nodes over one of a plurality of paths therebetween, each such path comprising a respective sequence of the links; and in response to the request: if the resources already allocated to the first node on one of the paths are sufficient, directing the data flow from the first node to the second node over the one of the paths without requesting additional resources; and if the resources already allocated to the first node are insufficient, performing the following steps: requesting an increase in an allocation to the first node of the requested resources; determining, for the links comprised by each of the paths, respective levels of use of the requested resources due to communications in progress over the network; selecting which of the paths is to carry the data flow responsive to the determined levels of use of the requested resources on the links comprised in each of the paths; and			

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increasing the allocation of the resources to the first node on the selected path by a predetermined quantum. 10. A method according to claim 1, wherein selecting which of the paths is to carry the data flow comprises selecting the one of the paths having the lowest level of a predetermined measure of use of the requested resources. 14. A method according to claim 1, and comprising, upon release of the requested resources: comparing an amount of the resources that have been released to a predetermined threshold; and if the amount is greater than the predetermined threshold, deallocating the predetermined quantum from the first node. 15. A communication network, comprising: a plurality of nodes, comprising at least first and second nodes; a plurality of links, interconnecting the nodes to provide communications therebetween; and a dispatcher, which is adapted to allocate a respective number of quanta of one or more resources in the network to each of the nodes, wherein the first node is adapted, upon receiving a request to use a portion of the resources so as to carry			

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the data flow between the first and second nodes over one of a plurality of paths therebetween, each such path comprising a respective sequence of the links, to direct the data flow from the first node to the second node over one of the paths without requesting additional resources if the resources already allocated to the first node on the one of the paths are sufficient, and to request an increase in an allocation of the requested resources to the first node if the resources already allocated to the first node are insufficient, and wherein in response to the increase requested by the first node, the dispatcher is adapted to determine, for the links comprised in each of the paths, respective levels of use of the requested resources due to communications in progress over the network and to select which of the paths is to carry the data flow responsive to the determined levels of use of the requested resources on the links comprised in each of the paths, and to increase the allocation of the resources to the first node on the selected path by a predetermined quantum. 16. A network according to claim 15, wherein the dispatcher is adapted to select for carrying the data flow the one of the paths that has the lowest level of a predetermined measure of use of the requested resources.			

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18. A network according to claim 15, wherein the first node is adapted, upon release of the requested resources, to compare an amount of the resources that have been released to a predetermined threshold, and if the amount is greater than the predetermined threshold, to deallocate the predetermined quantum from the first node.			
'279 Patent, Claims 1, 14, 15, 18 “quantum” 1. In a communication network that includes a plurality of nodes interconnected by links, the nodes including at least first and second nodes, a method for routing a data flow, comprising: allocating a respective number of quanta of one or more resources in the network to each of the nodes; receiving a request at the first node to use a portion of the resources so as to carry the data flow between the first and second nodes over one of a plurality of paths therebetween, each such path comprising a respective sequence of the links; and in response to the request: if the resources already allocated to the first node on one of the paths are sufficient, directing the data flow from the first node to the second node over the	<u>Proposed Construction:</u> Plain and ordinary meaning	<u>Proposed Construction:</u> “an amount of a requested resource by which to increase or decrease”	

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one of the paths without requesting additional resources; and if the resources already allocated to the first node are insufficient, performing the following steps: requesting an increase in an allocation to the first node of the requested resources; determining, for the links comprised by each of the paths, respective levels of use of the requested resources due to communications in progress over the network; selecting which of the paths is to carry the data flow responsive to the determined levels of use of the requested resources on the links comprised in each of the paths; and increasing the allocation of the resources to the first node on the selected path by a predetermined quantum. 14. A method according to claim 1, and comprising, upon release of the requested resources: comparing an amount of the resources that have been released to a predetermined threshold; and if the amount is greater than the predetermined threshold, deallocating the predetermined quantum from the first node. 15. A communication network, comprising:			

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a plurality of nodes, comprising at least first and second nodes; a plurality of links, interconnecting the nodes to provide communications therebetween; and a dispatcher, which is adapted to allocate a respective number of quanta of one or more resources in the network to each of the nodes, wherein the first node is adapted, upon receiving a request to use a portion of the resources so as to carry the data flow between the first and second nodes over one of a plurality of paths therebetween, each such path comprising a respective sequence of the links, to direct the data flow from the first node to the second node over one of the paths without requesting additional resources if the resources already allocated to the first node on the one of the paths are sufficient, and to request an increase in an allocation of the requested resources to the first node if the resources already allocated to the first node are insufficient, and wherein in response to the increase requested by the first node, the dispatcher is adapted to determine, for the links comprised in each of the paths, respective levels of use of the requested resources due to communications in progress over the network and to select which of the paths is to carry the data flow responsive to the determined levels of use of the requested resources on the links comprised in			

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each of the paths, and to increase the allocation of the resources to the first node on the selected path by a predetermined quantum. 18. A network according to claim 15, wherein the first node is adapted, upon release of the requested resources, to compare an amount of the resources that have been released to a predetermined threshold, and if the amount is greater than the predetermined threshold, to deallocate the predetermined quantum from the first node.			
'394 Patent, Claims 8, 18 “a new processing unit added to the network element” 8. A method for communication, comprising: operating a network element, wherein the network element further comprises multiple interconnected processing units and multiple ports, wherein each processing unit is assigned to a different subset of the multiple ports of the network element, and wherein each processing unit contains a processor for processing packets communicated over the different subset of the multiple ports to which the processing unit is assigned; storing in each processing unit a respective list, each list indicating all of one or more multicast packet streams that are permitted for forwarding by	<u>Proposed Construction:</u> Plain and ordinary meaning	<u>Proposed Construction:</u> “a processing unit newly-inserted into the network element”	

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the network element, and further indicating which of the one or more ports each multicast packet stream is permitted to be forwarded to; receiving from a client a request relating to reception of a given multicast packet stream; distributing the request among the multiple processing units within the network element, and updating the respective list in each processing unit responsively to the request; and selectively forwarding multicast packets associated with the given multicast packet stream by the processing units in accordance with the respective updated lists, wherein operating the network element comprises initializing a new processing unit added to the network element by: deactivating the ports to which the new processing unit is assigned; while the ports to which the new processing unit is assigned are deactivated, sending a multicast status request, receiving multicast membership reports sent by multicast clients in response to the multicast status request, constructing the list by the new processing unit based on the received multicast membership reports; and after constructing the list, activating the ports to which the new processing unit is assigned.			

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18. A network element, comprising; multiple ports; and multiple interconnected processing units, wherein each processing unit is assigned to a different subset of the multiple ports of the network element, and wherein each processing unit contains a processor for processing packets communicated over the different subset of the multiple ports to which the processing unit is assigned, wherein the processing units are configured to process packets that are communicated over respective subsets of one or more of the ports, to store respective lists, each of which indicates all of one or more multicast packet streams that are permitted for forwarding by the network element and further indicates which of the one or more ports multicast packet stream is permitted to be forwarded to, to receive from a client a request relating to reception of a given multicast packet stream, and to distribute the request among the processing units within the network element so as to update the lists responsively to the distributed request and to selectively forward multicast packets associated with the given multicast packet stream in accordance with the updated lists, wherein a new processing unit added to the network element is configured to initialize by:			

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deactivating the ports to which the new processing unit is assigned; while the ports to which the new processing unit is assigned are deactivated, sending a multicast status request, receiving multicast membership reports sent by multicast clients in response to the multicast status request, constructing the list by the new processing unit based on the received multicast membership reports; and after constructing the list, activating the ports to which the new processing unit is assigned.			
'394 Patent, Claims 1, 3-6, 8-11, 13-16, 18 “multicast packet stream” 1. A method for communication, comprising: operating a network element, wherein the network element further comprises multiple interconnected processing units and multiple ports, wherein each processing unit is assigned to a different subset of the multiple ports of the network element, and wherein each processing unit contains a processor for processing packets communicated over the different subset of the multiple ports to which the processing unit is assigned; storing in each processing unit a respective list, each list indicating all of one or more multicast packet streams that are permitted for forwarding by the network element, and further indicating which of	<u>Proposed Construction:</u> Plain and ordinary meaning OR “A packet stream that can be sent to multiple devices”	<u>Proposed Construction:</u> “the actual content coming from a multicast source, such as a channel or movie”	

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the one or more ports each multicast packet stream is permitted to be forwarded to; receiving from a client a request relating to reception of a given multicast packet stream; distributing the request among the multiple processing units within the network element, and updating the respective list in each processing unit responsively to the request; and selectively forwarding multicast packets associated with the given multicast packet stream by the processing units in accordance with the respective updated lists, wherein operating the network element comprises aggregating two or more of the ports to form a high-capacity port, and wherein aggregating the ports comprises setting an upper limit on a number of the multicast packet streams that are permitted for forwarding over the high-capacity port, wherein the request indicates that the given multicast packet stream is to be forwarded over the high-capacity port, and wherein updating the list comprises modifying the list to indicate that the given multicast packet stream is permitted for forwarding over the high-capacity port only when the number of the multicast packet streams that are permitted for forwarding over the high-capacity port, including the given multicast packet stream, does not exceed the upper limit.			

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DISPUTED CONSTRUCTIONS			
Claim Language / Claim Term	Plaintiff's Proposed Construction	Cisco's Proposed Construction	Court's Construction
3. The method according to claim 1, wherein distributing the request comprises duplicating the request to produce first and second copies, forwarding the first copy to a source of the given multicast packet stream, and distributing the second copy among the multiple processing units. 4. The method according to claim 1, wherein distributing the request comprises distributing among the multiple processing units an identity of an ingress port over which the request was received at the network element, and wherein updating the list comprises causing the list to indicate that the given multicast packet stream is permitted for forwarding over the ingress port. 5. The method according to claim 1, wherein the ports forming the high-capacity port are assigned to at least two of the processing units, and wherein updating the list comprises holding respective local copies of the number of the multicast packet streams that are permitted for forwarding over the high-capacity port, updating the local copies based on the distributed request, and selectively updating the list in each of the at least two processing units based on the respective local copies.			

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6. The method according to claim 1, wherein the request specifies a requested action selected from a group of actions consisting of receiving the given multicast packet stream and stopping to receive the given multicast packet stream. 8. A method for communication, comprising: operating a network element, wherein the network element further comprises multiple interconnected processing units and multiple ports, wherein each processing unit is assigned to a different subset of the multiple ports of the network element, and wherein each processing unit contains a processor for processing packets communicated over the different subset of the multiple ports to which the processing unit is assigned; storing in each processing unit a respective list, each list indicating all of one or more multicast packet streams that are permitted for forwarding by the network element, and further indicating which of the one or more ports each multicast packet stream is permitted to be forwarded to; receiving from a client a request relating to reception of a given multicast packet stream; distributing the request among the multiple processing units within the network element, and updating the respective list in each processing unit responsively to the request; and			

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selectively forwarding multicast packets associated with the given multicast packet stream by the processing units in accordance with the respective updated lists, wherein operating the network element comprises initializing a new processing unit added to the network element by: deactivating the ports to which the new processing unit is assigned; while the ports to which the new processing unit is assigned are deactivated, sending a multicast status request, receiving multicast membership reports sent by multicast clients in response to the multicast status request, constructing the list by the new processing unit based on the received multicast membership reports; and after constructing the list, activating the ports to which the new processing unit is assigned. 9. The method according to claim 8, wherein updating the list comprises modifying the list to indicate that the given multicast packet stream is permitted for forwarding over a given port only when a number of the multicast packet streams that are permitted for forwarding over the given port, including the given multicast packet stream, does not exceed a maximum value specified for the given port.			

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DISPUTED CONSTRUCTIONS			
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10. The method according to claim 8, wherein updating the list comprises tracking a use of a permission to forward a certain multicast packet stream over a certain port by monitoring requests relating to the certain multicast packet stream that are received at the network element, and removing the permission from the list responsively to determining that the permission is aged. 11. A network element, comprising; multiple ports; and multiple interconnected processing units, wherein each processing unit is assigned to a different subset of the multiple ports of the network element, and wherein each processing unit contains a processor for processing packets communicated over the different subset of the multiple ports to which the processing unit is assigned, wherein the processing units are configured to process packets that are communicated over respective subsets of one or more of the ports, to store respective lists, each of which indicates all of one or more multicast packet streams that are permitted for forwarding by the network element and further indicates which of the one or more ports multicast packet stream is permitted to be forwarded to,			

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DISPUTED CONSTRUCTIONS			
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to receive from a client a request relating to reception of a given multicast packet stream, and to distribute the request among the processing units within the network element so as to update the lists responsively to the distributed request and to selectively forward multicast packets associated with the given multicast packet stream in accordance with the updated lists, wherein two or more of the ports are aggregated to form a high-capacity port, and wherein an upper limit is set on a number of the multicast packet streams that are permitted for forwarding over the high-capacity port, wherein the request indicates that the given multicast packet stream is to be forwarded over the high-capacity port, and wherein the processing units are configured to update the lists to indicate that the given multicast packet stream is permitted for forwarding over the high-capacity port only when the number of the multicast packet streams that are permitted for forwarding over the high-capacity port, including the given multicast packet stream, does not exceed the upper limit. 13. The network element according to claim 11, wherein a processing unit receiving the request is configured to duplicate the request to produce first and second copies, so as to forward the first copy to a source of the given multicast packet stream and			

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distribute the second copy among the multiple processing units. 14. The network element according to claim 11, wherein a processing unit receiving the request is configured to distribute among the multiple processing units an identity of an ingress port over which the request was received, and wherein the processing units are configured to cause the respective lists to indicate that the given multicast packet stream is permitted for forwarding over the ingress port. 15. The network element according to claim 11, wherein the ports forming the high-capacity port are assigned to at least two of the processing units, and wherein the at least two processing units are configured to hold respective local copies of the number of the multicast packet streams that are permitted for forwarding over the high-capacity port, to update the local copies based on the distributed request, and to selectively update their respective lists based on the respective local copies. 16. The network element according to claim 11, wherein the processing units are configured to track a use of a permission to forward a certain multicast packet stream over a certain port by monitoring			

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requests relating to the certain multicast packet stream that are received at the network element, and to remove the permission from the respective lists responsively to determining that the permission is aged. 18. A network element, comprising; multiple ports; and multiple interconnected processing units, wherein each processing unit is assigned to a different subset of the multiple ports of the network element, and wherein each processing unit contains a processor for processing packets communicated over the different subset of the multiple ports to which the processing unit is assigned, wherein the processing units are configured to process packets that are communicated over respective subsets of one or more of the ports, to store respective lists, each of which indicates all of one or more multicast packet streams that are permitted for forwarding by the network element and further indicates which of the one or more ports multicast packet stream is permitted to be forwarded to, to receive from a client a request relating to reception of a given multicast packet stream, and to distribute the request among the processing units within the network element so as to update the lists			

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responsively to the distributed request and to selectively forward multicast packets associated with the given multicast packet stream in accordance with the updated lists, wherein a new processing unit added to the network element is configured to initialize by: deactivating the ports to which the new processing unit is assigned; while the ports to which the new processing unit is assigned are deactivated, sending a multicast status request, receiving multicast membership reports sent by multicast clients in response to the multicast status request, constructing the list by the new processing unit based on the received multicast membership reports; and after constructing the list, activating the ports to which the new processing unit is assigned.			
'637 Patent, Claims 1, 2, 16-25 “ a network ” / “ a communication network ” 1. A method for handling a communication failure in a network , comprising: provisioning different first and second instances of a multipoint-to-multipoint (MP-MP) communication service over respective first and second alternative sets of links that connect a plurality of endpoints in the network , each of the	<u>Proposed Construction:</u> Plain and ordinary meaning	<u>Proposed Construction:</u> “a VPLS network”	

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sets traversing a plurality of network nodes, which provide physical layer resources for operating the links; providing the communication service to the endpoints over the first set of links using the first instance; upon detecting a failure in the first set of links by a detecting node of the plurality of network nodes: propagating failure information by the detecting node to each node of the other nodes of the plurality of network nodes traversed by the first set of links; for each node of the other nodes of the plurality of network nodes traversed by the first set of links: receiving the failure information; and deactivating a physical layer of the first set of links connected thereto, thereby causing a loss of connectivity in the first set of links; and responsively to sensing the loss of connectivity, resuming the communication service over the second instance by automatically transferring communication among the endpoints to the second set of links. 2. The method according to claim 1, wherein the network comprises a ring network. 16. A communication network serving a plurality of endpoints, the network comprising:			

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a plurality of links, comprising at least first and second alternative sets of links that interconnect the endpoints via the network; and network nodes, which are traversed by the first and second sets of links and are arranged: to provide physical layer resources for operating the links; to provide a communication service to the endpoints over the first set of links using a first instance of the communication service; to detect a local failure in the first set of links; to propagate a first message notifying all other nodes in the network that are traversed by the first set of links upon detecting the local failure; and to receive a second message from another node indicating a remote failure in the first set of links; and responsively to receiving the second message indicating the remote failure, to deactivate the physical layer resources of each node to links in the first set of links connected to that node upon receiving the second message, to cause a loss of connectivity in the first set of links and thus cause an automatic transfer of communication among the endpoints to the second set of links, and to resume the communication service over the second set of links using a second instance of the communication service different from the first instance.			

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17. The network according to claim 16, wherein a first network node is arranged to detect the failure and to send a third message indicating the failure to a second network node, and wherein a third network node, which provides the physical layer resources to links in the first set, is arranged to deactivate the physical layer resources responsively to accepting the third message.			
18. The network according to claim 16, wherein the one or more of the links in the first set of links comprise optical links, and wherein the network nodes comprise respective laser sources for driving the optical links and are arranged to deactivate the physical layer resources by disabling the laser sources.			
19. The network according to claim 16, wherein the one or more of the links in the first set of links comprise wire links, and wherein the network nodes are arranged to deactivate the physical layer resources by disabling respective carrier signals of the wire links.			
20. The network according to claim 16, wherein the one or more of the links in the first set of links use a physical layer auto-negotiation protocol, and wherein the network nodes are arranged to			

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deactivate the physical layer resources by introducing an auto-negotiation error into the auto-negotiation protocol.			
21. The network according to claim 16, wherein a subset of the links in the first set of links are classified as critical links, and wherein the network nodes are arranged to deactivate the physical layer resources only when the failure occurs in one of the critical links.			
22. The communication network of claim 16, wherein a link in the first set of links includes an optical link, and wherein deactivating the physical layer resources includes disabling a laser source of the optical link.			
23. The communication network of claim 16, wherein a link in the first set of links includes a wire link, and wherein deactivating the physical layer resources includes disabling a carrier signal of the wire link.			
24. The communication network of claim 16, wherein a link in the first set of links includes a link which uses a physical layer auto-negotiation protocol, and wherein deactivating the physical layer			

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resources includes introducing an auto-negotiation error into the auto-negotiation protocol. 25. The communication network of claim 16, wherein a link in the first set of links includes a logical link, and wherein deactivating the physical layer resources includes releasing an association of the logical link with the first instance of the communication service.			
'637 Patent, Claims 1, 6-10, 12-25 “ deactivating a physical layer of the first set of links connected thereto ” / “ deactivate the physical layer resources of each node to links in the first set of links connected to that node ” 1. A method for handling a communication failure in a network, comprising: provisioning different first and second instances of a multipoint-to-multipoint (MP-MP) communication service over respective first and second alternative sets of links that connect a plurality of endpoints in the network, each of the sets traversing a plurality of network nodes, which provide physical layer resources for operating the links;	<u>Proposed Construction:</u> Plain and ordinary meaning	<u>Proposed Construction:</u> “deactivating the physical layer[] of all links connected [to] all other nodes other than the detecting node” / “deactivate the physical layer[] of all links connected [to] all other nodes other than the detecting node”	

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providing the communication service to the endpoints over the first set of links using the first instance; upon detecting a failure in the first set of links by a detecting node of the plurality of network nodes: propagating failure information by the detecting node to each node of the other nodes of the plurality of network nodes traversed by the first set of links; for each node of the other nodes of the plurality of network nodes traversed by the first set of links: receiving the failure information; and deactivating a physical layer of the first set of links connected thereto, thereby causing a loss of connectivity in the first set of links; and responsively to sensing the loss of connectivity, resuming the communication service over the second instance by automatically transferring communication among the endpoints to the second set of links. 6. The method according to claim 1, wherein the one or more of the links in the first set of links comprise optical links, and wherein said deactivating the physical layer resources comprises disabling respective laser sources of the optical links. 7. The method according to claim 1, wherein the one or more of the links in the first set of links comprise			

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wire links, and wherein said deactivating the physical layer resources comprises disabling respective carrier signals of the wire links. 8. The method according to claim 1, wherein the one or more of the links in the first set of links use a physical layer auto-negotiation protocol, and wherein said deactivating the physical layer resources comprises introducing an auto-negotiation error into the auto-negotiation protocol. 9. The method according to claim 1, wherein the one or more of the links in the first set of links comprise a logical link, and wherein said deactivating the physical layer resources comprises releasing an association of the logical link with the first instance of the communication service. 10. The method according to claim 1, wherein a link of the first set of links is a critical link, and wherein said deactivating the physical layer is performed only when the failure occurs in the critical link. 12. The method of claim 1, wherein a link in the first set of links includes an optical link, and wherein deactivating the physical layer includes disabling a laser source of the optical link.			

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13. The method of claim 1, wherein a link in the first set of links includes a wire link, and wherein deactivating the physical layer includes disabling a carrier signal of the wire link.			
14. The method of claim 1, wherein a link in the first set of links includes a link which uses a physical layer auto-negotiation protocol, and wherein deactivating the physical layer includes introducing an auto-negotiation error into the auto-negotiation protocol.			
15. The method of claim 1, wherein a link in the first set of links includes a logical link, and wherein deactivating the physical layer includes releasing an association of the logical link with the first instance of the communication service.			
16. A communication network serving a plurality of endpoints, the network comprising: a plurality of links, comprising at least first and second alternative sets of links that interconnect the endpoints via the network; and network nodes, which are traversed by the first and second sets of links and are arranged: to provide physical layer resources for operating the links;			

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to provide a communication service to the endpoints over the first set of links using a first instance of the communication service; to detect a local failure in the first set of links; to propagate a first message notifying all other nodes in the network that are traversed by the first set of links upon detecting the local failure; and to receive a second message from another node indicating a remote failure in the first set of links; and responsively to receiving the second message indicating the remote failure, to deactivate the physical layer resources of each node to links in the first set of links connected to that node upon receiving the second message, to cause a loss of connectivity in the first set of links and thus cause an automatic transfer of communication among the endpoints to the second set of links, and to resume the communication service over the second set of links using a second instance of the communication service different from the first instance. 17. The network according to claim 16, wherein a first network node is arranged to detect the failure and to send a third message indicating the failure to a second network node, and wherein a third network node, which provides the physical layer resources to links in the first set, is arranged to deactivate the			

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physical layer resources responsively to accepting the third message. 18. The network according to claim 16, wherein the one or more of the links in the first set of links comprise optical links, and wherein the network nodes comprise respective laser sources for driving the optical links and are arranged to deactivate the physical layer resources by disabling the laser sources. 19. The network according to claim 16, wherein the one or more of the links in the first set of links comprise wire links, and wherein the network nodes are arranged to deactivate the physical layer resources by disabling respective carrier signals of the wire links. 20. The network according to claim 16, wherein the one or more of the links in the first set of links use a physical layer auto-negotiation protocol, and wherein the network nodes are arranged to deactivate the physical layer resources by introducing an auto-negotiation error into the auto-negotiation protocol. 21. The network according to claim 16, wherein a subset of the links in the first set of links are			

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classified as critical links, and wherein the network nodes are arranged to deactivate the physical layer resources only when the failure occurs in one of the critical links.			
22. The communication network of claim 16, wherein a link in the first set of links includes an optical link, and wherein deactivating the physical layer resources includes disabling a laser source of the optical link.			
23. The communication network of claim 16, wherein a link in the first set of links includes a wire link, and wherein deactivating the physical layer resources includes disabling a carrier signal of the wire link.			
24. The communication network of claim 16, wherein a link in the first set of links includes a link which uses a physical layer auto-negotiation protocol, and wherein deactivating the physical layer resources includes introducing an auto-negotiation error into the auto-negotiation protocol.			
25. The communication network of claim 16, wherein a link in the first set of links includes a logical link, and wherein deactivating the physical layer resources includes releasing an association of			

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the logical link with the first instance of the communication service.			