

# Cisco Systems, Inc. v. Portsmouth Network Corp.,

## **PATENT OWNER PORTSMOUTH PRESENTATION**

Inter Partes Review of  
U.S. Patent No. 7,035,279

IPR2024-00503

## Petitioner's Grounds for Challenges

| Grounds | Claims    | Basis                                              |
|---------|-----------|----------------------------------------------------|
| #1      | 1-5, 9-18 | § 103 (Pre-AIA) over Kovvali and Kalman            |
| #2      | 6         | § 103 (Pre-AIA) over Kovvali, Kalman, and Masters  |
| #3      | 7-8       | § 103 (Pre-AIA) over Kovvali, Kalman, and RFC 2892 |

# Roadmap

## Ground 1

### Independent claims 1 & 15

*Kovvali and Kalman*

- No motivation to combine Kovvali and Kalman
- Cited art fails to teach limitations relating to receiving a request.  
"Receiving a request at the first node to use a portion of the resources as to carry the data flow between the first and second nodes."

## Ground 3

### Dependent claims 7 & 8

*Kovvali, Kalman, and RFC 2892*

- No motivation to combine Kovvali and Kalman with RFC 2892
- Cited art fails to teach limitations relating to a resource budget.
  - "Comparing an amount of the one or more resources requested to a resource budget assigned to the first node"
  - "Comparing the amount of each of the resources requested to the resource budget assigned for each of the resources"

Ground 1

Independent claims 1 & 15

*Kovvali and Kalman*

# No Motivation to Combine *Kovvali and Kalman*

# Kovvali is Directed to a “Centralized System Using an Arbiter Node to Manage Network Capacity in a SONET Infrastructure”

(12) **United States Patent**  
Kovvali et al.

(10) Patent No.: **US 6,920,113 B1**  
(45) Date of Patent: **Jul. 19, 2005**

(54) **TRANSPORT OF ISOCRONOUS AND BURSTY DATA ON A SONET RING**

(75) Inventors: **Surya Kumar Kovvali**, Westborough, MA (US); **Ranjit Raghavan**, Waltham, MA (US)

(73) Assignee: **Teledina Inc.**, Santa Clara, CA (US)

(\*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **09/536,416**

(22) Filed: **Mar. 28, 2000**

(51) Int. Cl.: **H04L 12/28**

(52) U.S. Cl.: **370/255; 370/271; 370/346; 370/350; 370/352; 370/395.1**

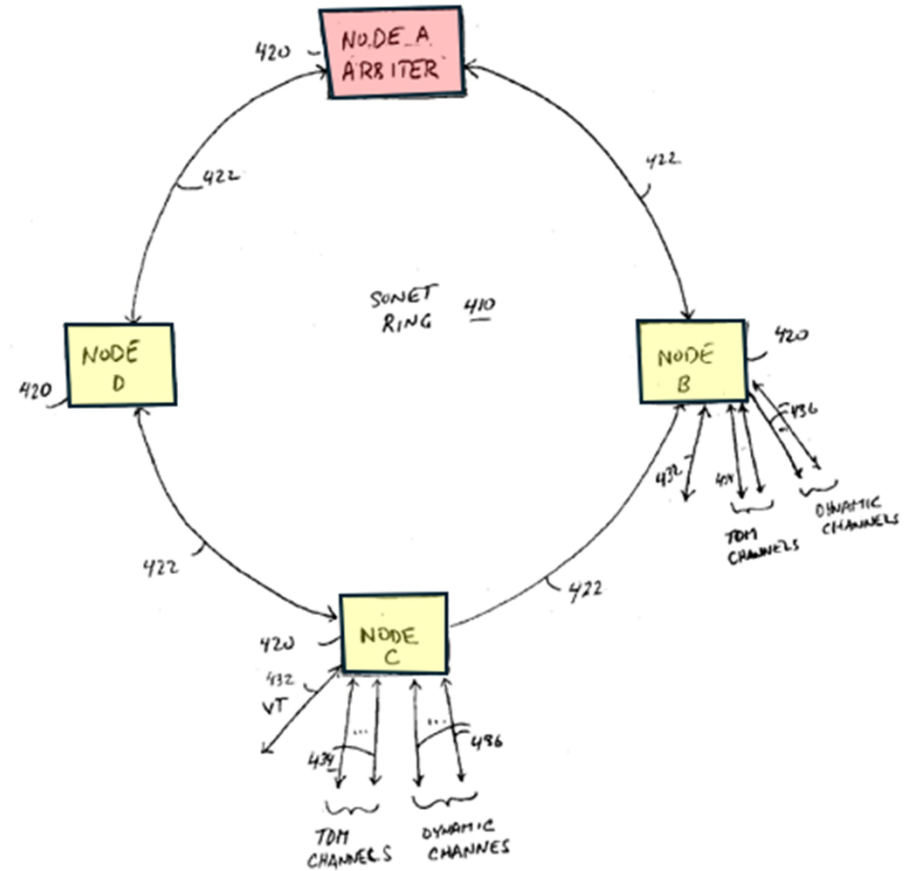
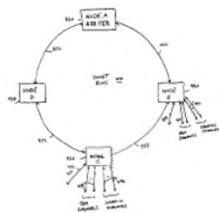
(58) Field of Search: **370/255, 258, 370/271, 346, 350, 352, 395.1, 431, 395.51**

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24 Claims, 11 Drawing Sheets



# Kalman is Directed to “Novel Network Protection and Restoration Techniques”

## (12) United States Patent Kalman et al.

(10) Patent No.: US 6,680,912 B1  
(45) Date of Patent: Jan. 20, 2004

### (54) SELECTING A ROUTING DIRECTION IN A COMMUNICATIONS NETWORK USING A COST METRIC

(75) Inventors: Robert F. Kalman, Cupertino, CA (US); Jason C. Fan, Mountain View, CA (US); Charles E. Barry, Campbell, CA (US); Prasad P. Jogalekar, Sunnyvale, CA (US); Vinay K. Hannal, Mountain View, CA (US)

(73) Assignee: Luminous Networks, Inc., Cupertino, CA (US)

(\*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: 09/519,024

(22) Filed: Mar. 3, 2000

(51) Int. Cl.<sup>7</sup> G01R 31/08; G06F 11/00; H04J 1/16; H04J 3/14

(52) U.S. Cl. 370/238; 455/445; 370/351

(58) Field of Search 370/238, 404, 237, 351, 222, 223, 224, 225, 242, 245

### (56) References Cited

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Primary Examiner—William Chin  
Assistant Examiner—Jamil A. Fox  
(74) Attorney, Agent, or Firm—Sawyer Law Group LLP

### ABSTRACT

The disclosed network includes two rings, wherein a first ring transmits data in a clockwise direction, and the other ring transmits data in a counterclockwise direction. The traffic is removed from the ring by the destination node. During normal operations (i.e., all spans operational), data between nodes flows on the ring that would provide the minimum number of hops to the destination node. Thus, both rings are fully utilized during normal operations. The nodes periodically test the bit error rate of the links (or the error rate is constantly calculated) to detect a fault in one of the links. The detection of such a fault sends a broadcast signal to all nodes to reconfigure a routing table within the node so as to identify the optimum routing of source traffic to the destination node after the fault. Since the available links will now see more data traffic due to the failed link, traffic designated as “unprotected” traffic is given lower priority and may be dropped or delayed in favor of the “protected” traffic. Specific techniques are described for identifying a failed link, communicating the failed link to the other nodes, differentiating between protected and unprotected classes of traffic, and updating the routing tables.

7 Claims, 6 Drawing Sheets

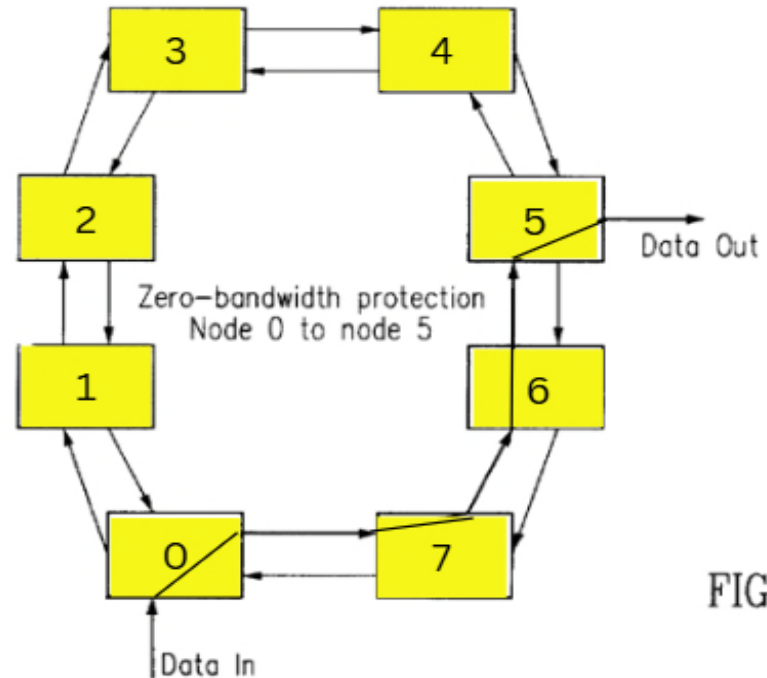
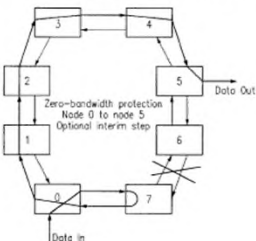
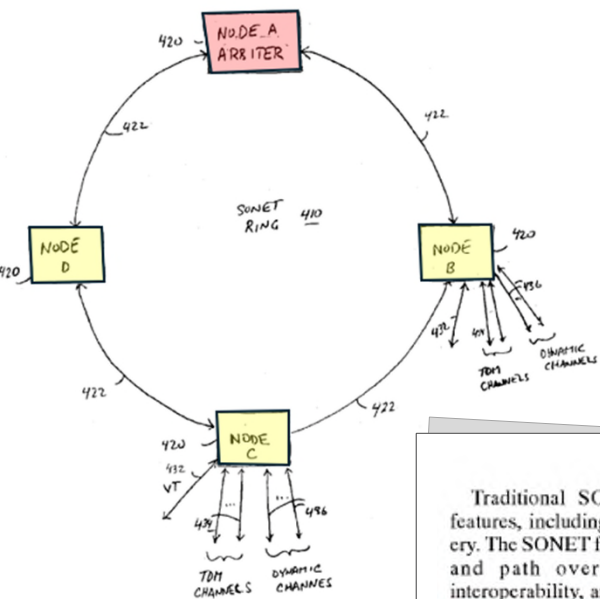


FIG. 3

## No Reason To Combine Kovalli (Directed to Managing Network Capacity Using an Arbiter Node) with Kalman (Directed to Novel Network Protection and Restoration Techniques)

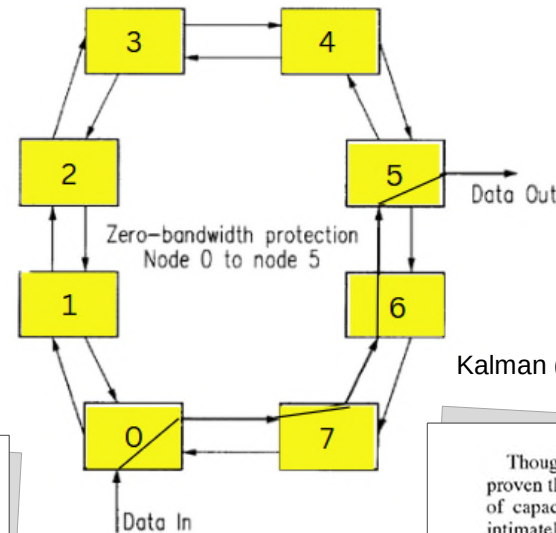


Kovalli (Ex. 1005) at Fig. 4.

### SUMMARY

Traditional SONET equipment has several desirable features, including interoperability and speedy fault recovery. The SONET framing structure, and the defined transport and path overhead bytes provide the basis for interoperability, and provide mechanisms for fault management and protection switching. However, the SONET framing structure, virtual tributary approach and payload mapping are not well suited to carrying data at rates that do not match the SONET signal hierarchy, or that exhibit bursty or time-varying rates.

In a general aspect, the invention provides a method and apparatus for using SONET technology to efficiently carry both data and voice traffic by Add/Drop Multiplexing of both isochronous traffic, such as voice and video, and non-isochronous traffic, such as data, in a SONET/SDH fiber-optic ring topology. A portion of a SONET/SDH frame



Kalman (Ex. 1006) at Fig. 3.

Though these SONET ring protection technologies have proven themselves to be robust, they are extremely wasteful of capacity. Additionally, both UPSR and BLSR depend intimately on the capabilities provided by SONET for their operation, and therefore cannot be readily mapped onto non-SONET transport mechanisms.

What is needed is a protection technology where no extra network capacity is consumed during "normal" operation (i.e., when all ring spans are operational), which is less tightly linked to a specific transport protocol, and which is designed to meet the Telcordia 50 millisecond switching requirement.

### SUMMARY

A network protection and restoration technique is described that efficiently utilizes the total bandwidth in the network to overcome the drawbacks of the previously described networks, that is not linked to a specific transport protocol such as SONET, and that is designed to meet the Telcordia 50 millisecond switching requirement. The dis-

## Petitioner's Four Reasons For Combining Kovvali and Kalman Are Based On Hindsight Bias

1. The combination would have been obvious because it represents merely the “use of Kalman’s known technique for selecting a preferred path on a ring network to improve Kovvali’s multi-path ring network for transmitting dynamic frames in the same way.”
2. The combination would have been obvious because the application of Kalman’s technique to improve Kovvali’s method “ready for improvement would yield predictable results. Here, the improvement provided to Kovvali’s multi-path ring network by Kalman’s path selection technique is efficient transmission of dynamic frames in a ring network using a lowest-cost path.”
3. A POSITA would have been motivated to implement “Kalman’s ring selection technique in Kovvali’s centralized bandwidth manager (the ‘arbiter node’) to optimize the use of network resources for all dynamic channels instead of just one.” Petition, 25-26.
4. A POSITA would have a reasonable expectation of success “because of the overall similarities between the network architectures and technologies described in Kovvali and Kalman” (e.g. bi-directional ring networks transmitting frames between nodes over an optical network), and Kalman describes that its path-selection technique may be applied “to any network transmitting frames, cells, or using any other protocol.” Petition, 26.

In re Jeffrey B. GORMAN and  
Marilyn Katz.  
No. 90-1362.  
United States Court of Appeals,  
Federal Circuit.  
May 13, 1991.

bring judgment to bear. It is impermissible, however, simply to engage in a hindsight reconstruction of the claimed invention, using the applicant’s structure as a template and selecting elements from references to fill the gaps. *Interconnect Planning*, 774 F.2d at 1143, 227 USPQ at 551. The references themselves must provide some teaching whereby the applicant’s combination would have been obvious.

TQ DELTA, LLC, Appellant  
v.  
CISCO SYSTEMS, INC., Dish Network  
LLC, Comcast Cable Communica-  
tions, LLC, COX Communica-  
tions, LLC, Time Warner Cable Enterprises  
LLC, Verizon Services Corp., ARRIS  
Group, Inc., Appellees  
2018-1766, 2018-1767  
United States Court of Appeals,  
Federal Circuit.  
Decided: November 22, 2019

2008)). In particular, “[t]he expert failed to explain how specific references could be combined, which combination(s) of elements in specific references would yield a predictable result, or how any specific combination would operate or read on the asserted claims.” *Id.*

Ground 1

Independent claims 1 & 15

*Kovvali and Kalman*

# ***Kovvali and Kalman Do Not Disclose a “Request”***

# U.S. Patent No. 7,035,279 – Independent Claims 1 and 15

Barcode: US007035279B2

(12) **United States Patent**  
**Bruckman**

(10) **Patent No.:** **US 7,035,279 B2**  
(45) **Date of Patent:** **Apr. 25, 2006**

(54) **FLOW ALLOCATION IN A RING TOPOLOGY**

(75) **Inventor:** **Leon Bruckman, Petach Tikva (IL)**

(73) **Assignee:** **Corrigent Systems Ltd., Tel Aviv (IL)**

(\*) **Notice:** Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 756 days.

(21) **Appl. No.:** **09/756,946**

(22) **Filed:** **Jan. 9, 2001**

(65) **Prior Publication Data**  
US 2002/0118700 A1 Aug. 29, 2002

(51) **Int. Cl.:** **H04L 12/43** (2006.01)

(52) **U.S. Cl.:** **370/469; 370/395.21; 370/395.41; 370/406; 709/225; 709/226; 709/232; 709/238**

(58) **Field of Classification Search**  
370/395.21, 395.41, 395.42, 406, 439, 460  
See application file for complete search history.

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**ABSTRACT**  
(57) In a communication network that includes a plurality of nodes interconnected by links, a method for routing a data flow includes receiving a request to allocate one or more resources in the network so as to carry the data flow between first and second nodes over one of a plurality of paths therebetween, each such path including a respective sequence of the links. For the links included in each of the paths, respective levels of use of the requested resources due to communications in progress over the network are determined. The path that is to carry the data flow is selected responsive to the determined levels of use of the requested resources on the links included in each of the paths.

**18 Claims, 4 Drawing Sheets**

The diagram illustrates a ring topology network. A central dispatcher (28) is connected to a series of nodes (22) arranged in a ring. The nodes are labeled N\_1,1, N\_1,2, N\_2,3, N\_3,4, N\_4,5, and N\_5,6. The links between the nodes are labeled 1, 2, 3, 4, 5, and 6. The dispatcher is connected to the nodes via links 1 and 6. The nodes are also connected to each other via links 1, 2, 3, 4, 5, and 6. The dispatcher is also connected to the nodes via links 1 and 6. The nodes are also connected to each other via links 1, 2, 3, 4, 5, and 6.

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 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;

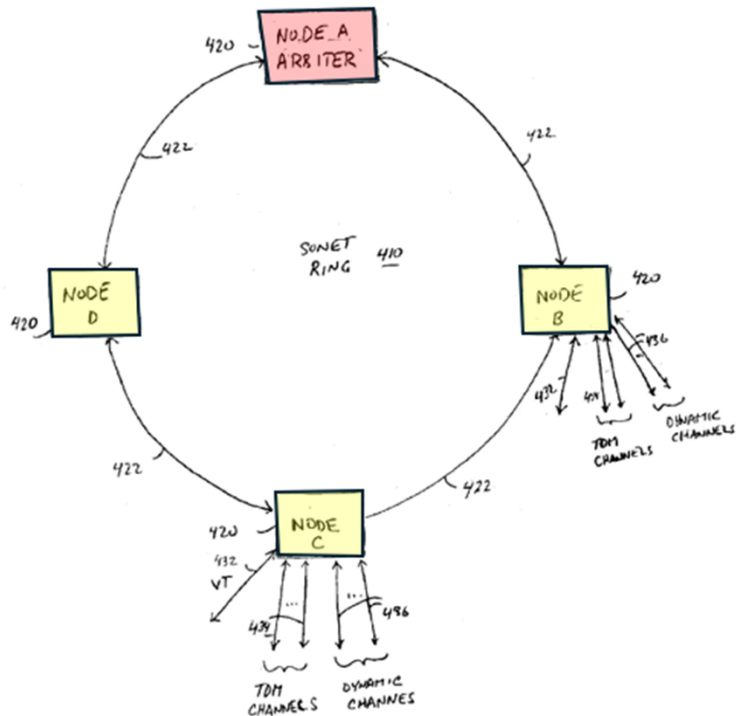
a plurality of links, interconnecting the nodes to provide communications therebetween; and

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 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

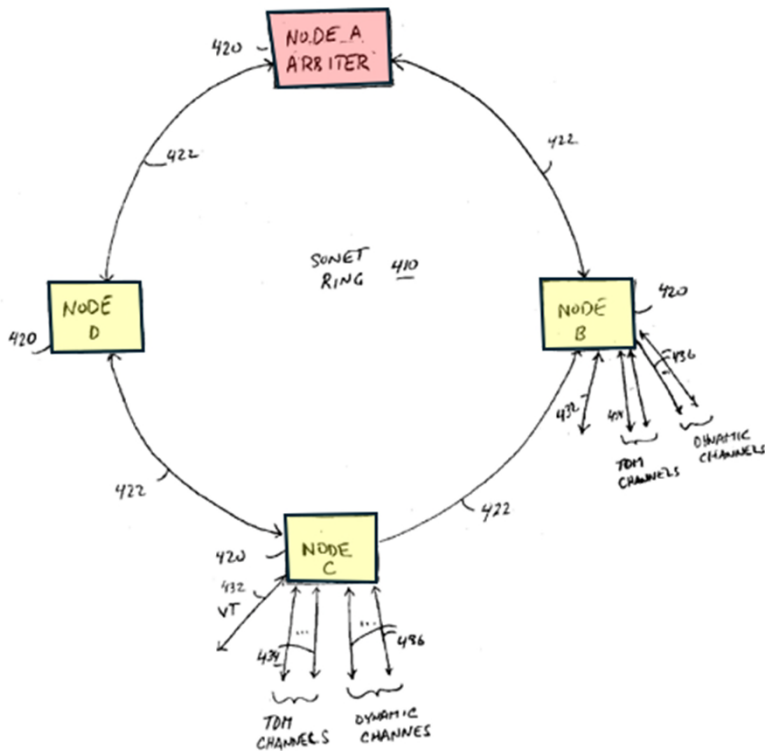
wherein in response to the increase requested by the first node, the dispatcher is adapted to determine, for the links comprised in each of the paths, respective levels of use of the requested resources due to communications in progress over the network and to select which of the paths is to carry the 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.

## The Arbiter (Which Petition Does not Identify) Receives Requests



In order to dynamically manage the TDM and dynamic channels, one node 420 is assigned to be the arbiter node at the time the ring is provisioned. The remaining nodes that make use of the TDM and dynamic channels are client nodes. In FIG. 4, node A is the arbiter node and the remaining nodes are client nodes. Requests to assign dynamic channels for communication between particular nodes are sent from a client nodes to the arbiter. The arbiter responds to the requests by assigning dynamic channels to particular nodes, and by adjusting the allocated rates for the dynamic channels.

## There is No Dispute That Nodes B or C Receive Data in Response to Sending Requests to the Arbiter



In order to dynamically manage the TDM and dynamic channels, one node **420** is assigned to be the arbiter node at the time the ring is provisioned. The remaining nodes that make use of the TDM and dynamic channels are client nodes. In FIG. 4, node A is the arbiter node and the remaining nodes are client nodes. Requests to assign dynamic channels for communication between particular nodes are sent from a client nodes to the arbiter. The arbiter responds to the requests by assigning dynamic channels to particular nodes, and by adjusting the allocated rates for the dynamic channels.

## Petitioner's Attempts to Distract With Red-Herrings Because Kovvali Does Not Disclose A First Node Receiving a Request

- Even if the Board adopts Petitioner's proposed constructions (which it should not), Kovvali and Kalman still fail to disclose the claimed "request"
- Nothing in Dr. Olivier's testimony suggests or implies that Kovvali and Kalman disclose the claimed "request"
- The specification, dependent claims and file history confirm that the independent claims of the '279 Patent require a first node receiving a request, which Kovvali and Kalman fail to disclose
- Assuming Petitioner's argument that the claims do not require an explicit or formal request (which is not true), there is no dispute that the '279 Patent requires a request, and Kovvali and Kalman disclose a first node receiving data, not a request.

Ground 3

Dependent claims 7 & 8

*Kovvali and Kalman  
with RFC2892*

# No Motivation to Combine *Kovvali and Kalman with RFC2892*

## Asserting That References Are in the Same General Field is Not a Valid Motivation to Combine

1. Kovvali and Kalman each describe “spatial reuse” for ring traffic. In particular, Kovvali describes explicitly using a “Spatial Reuse Protocol (SRP)” allowing reuse of ring bandwidth across different sections of a ring of nodes. Ex.1005, 4:12-18.
2. Kovvali also describes explicitly using a supplementary Spatial Reuse Protocol algorithm “called SRP Fairness algorithm (SRP-fa) ... defined to achieve fair sharing of bandwidth between various nodes in a ring topology.” Ex.1005, 4:18-21.
3. RFC2892 is prior art publication that specifies the “Spatial Reuse Protocol” (SRP) for use with ring based media. Ex.1018, 1.

# ***RFC2892 Does Not Disclose a Resource Budget***

## Claims 7 and 8 Depend From Claim 1 Which Relates to Macro Level Congestion

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:

7. A method according to claim 1, wherein selecting which of the paths is to carry the data flow comprises comparing an amount of the one or more resources requested to a resource budget assigned to the first node, and permitting the data flow only if allocating the requested resources will not cause a total of the resources allocated to the first node to exceed the budget.

8. A method according to claim 7, wherein comparing the amount of the one or more resources comprises comparing the amount of each of the resources requested to the resource budget assigned for each of the resources, and wherein permitting the data flow comprises permitting the flow only if all of the resources requested for at least one of the paths are within the budget.

## Claims 7 and 8 Provide That the Dispatcher Component Selects Which Path is to Carry the Data Flow based on the Resource Budget Allocated to Each Node

In addition to maintaining segment availability information, the dispatcher is configured with the following parameters for each of the nodes with respect to each of the resources:

**node\_budget\_In**—Maximum amount of the resource that the node can receive on the inner ring.

**node\_budget\_Out**—Maximum amount of the resource that the node can receive on the outer ring.

When a node receives a request from one of its clients to send data to another node, the node first checks to determine whether it has sufficient resources already allocated to it in order to service the request. If the allocated resources are inadequate, the node submits a resource request to the dispatcher, indicating the destination node, at a request step 34. The dispatcher then checks whether there are resources available to the node on either the inner or the outer ring, at an availability checking step 36. There must both be sufficient unallocated resources left in the specific node budget and unused resources left on the appropriate segments of at least one of the rings in order for the dispatcher to grant the node's resource request. If not, the dispatcher refuses the request, at a refusal step 38, and the node returns an appropriate error report to the client application. Preferably, the dispatcher returns an error message to the node indicating the resource or resources that were lacking and thus led to the refusal.

## RFC2892 Discloses Resource Budgeting For Micro Level Congestion Management and Not Macro Level Congestion Management

Each node can send up to max\_usage. Max\_usage is a per node parameter that limits the maximum amount of low priority traffic a node can send.

The SRP-fa governs access to the ring. The SRP-fa only applies to low priority traffic. High priority traffic does not follow SRP-fa rules and may be transmitted at any time as long as there is sufficient transit buffer space.

# Summary

## Ground 1

### Independent claims 1 & 15

*Kovvali and Kalman*

- No motivation to combine Kovvali and Kalman
- Cited art fails to teach limitations relating to receiving a request.  
"Receiving a request at the first node to use a portion of the resources as to carry the data flow between the first and second nodes."

## Ground 3

### Dependent claims 7 & 8

*Kovvali, Kalman, and RFC 2892*

- No motivation to combine Kovvali and Kalman with RFC 2892
- Cited art fails to teach limitations relating to a resource budget.
  - o "Comparing an amount of the one or more resources requested to a resource budget assigned to the first node"
  - o "Comparing the amount of each of the resources requested to the resource budget assigned for each of the resources"