IEEE 802 RPRSG (Resilient Packet Ring Study Group)
Plenary Meeting Minutes
Tampa, FL, November 6-9, 2000
Reporter: BJ Lee

Monday, November 6, 2000

58 signed individual attendees representing 39 organizations
(Attendance list is attached at the end, along with action items raised)

1:00pm: Welcome and Introduction (Mike Takefman)

Overview on voting procedures and rights, SA patent policy
Goal for this meeting: PAR and 5 Criteria approved by the SEC, Address comments/concerns of other dot groups, New discussions/presentations
Recap from previous thoughts on What is RPR?
- Dual counter rotating rings with
- Media independence: bit rate, # nodes, span distance
- Destination stripping
- Fast protection
- CoS, plug and play, large MTU (9216B), etc

Recap from previous thoughts on RPR model (2 MACs below RPR?)
802.17 first WG meeting in late Jan 2000 (in Bay Area?)

Question: Why not belong to 802.3?
Mike's answer: Even the 802.3 chair (Geoff Thomson) does not believe it is true.

1:30pm: Agenda Scrub (Mike Takefman)
1:35pm: Review Minutes of Last Meeting
- Potential disagreement on the RPR objectives

1:43pm: Outstanding action item updates
- Lauren Schlicht's action item remains (Closed on Tuesday, Nov 7)
- T1X1 response (Closed)
- Mike Takefman's task force on D/Q/p compatibility (Not resolved)
- Suggestion on Web-based action item tracking. Will be considered

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1:45pm: IETF activity update (Albert Herrera)
- IPoPTR (IP over Packet Transport Rings) charter to be revised for approval
- Framework document is the current target
  - After IESG approval, will pursue informational RFC
  - will work with routing and TE groups
- Next IETF BOF in Dec 11th
- Requested to be closely coordinated with IEEE RPR, but no formal liaison...

Comments: RPRSG should discuss how to deal with IETF liaison issue
Question: L3 IPoPTR has duplication with L2 RPR, such as protection?
Answer: No, clean abstraction will be the target.

2:05pm: T1X1 update (Nevin Jones)

- Data over Sonet GFP
  - Core header framing part is well on the way and settled
- Payload header part needs more work, and basic protection mechanism being worked on
- A draft standard
- May overlap with RPR, but no formal attempt for coordination has been made so far

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2:12pm: Presentation: In Search of Fragmentation (Denton Gentry at Sun Microsystems)

- Various MTU adjustment mechanisms including TCP MSS, IP MTU discovery

Q: What happens with multicast, using IP MTU discovery?
A: Typically, keep the MTU small. UDP applications also typically keep MTU small, such as video multicast, DNS 576 byte. Most bulk data transfer applications use TCP with large MTU. For Sun Microsystems, large MTU (e.g., 9000 Bytes) deemed necessary

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2:40pm: Presentation: DiffServ Switch Requirement (Juha Heinanen)

- Implications of DiffServ for RPR

Comments: Node-based fairness should only be for high-DP traffic

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3:10pm: Comments/Concerns from Roy Bynum of Worldcom (as an 802.3 representative?)

- RPR should be able to support either ring and mesh topology. Interconnection of rings (IEEE 802.5) through source routed bridges was an operational nightmare preventing scalability
- If RPR is only to work on rings, it may end up being a niche product.

Q: How about large scale ring interconnection through transparent bridges?
A: Not clear.

3:30pm: Addressing Concerns raised by IEEE 802.3 group (Joint meeting. Questions are from the members of 802.3 group)

- Overview of RPRWG 5 Criteria (Mike Takefman)

(Only some of the major questions from 802.3 group are captured here).
Q: Why ring?
A: Mesh may not be possible due to fiber availability? (Mike Takefman)
Q: Interconnection of rings becomes mesh. Ring is a degenerate case of mesh, so why not doing mesh?
A: It is up to the customers who will decide. 802.3 Ethernet may be cheap, but switch

box itself may be expensive especially for redundancy, and with respect to port count, power requirement, space, etc.

A: Linear topology is a degenerate case of ring. Topological question on whether the ring or mesh is not the domain of MAC.

A: Network topology issue will need to be further investigated in conjunction with 802.1 and other groups.

Q: Transparent bridging will be supported?

A: Yes, since RPR is compatible with 802.1D

Q: MTU size question: Should go back and rethink, if RPRWG would suggest the giant packet.

A: large MTU is an optimization for certain applications

Q: 64 bit MAC addressing? Isochronous traffic support?

A: No, guarantee of latency will still be provided

Q: Bandwidth allocation and QoS? A: Yes.

Q: Regarding Criterion 3, if all the items are referring to higher layer problems in a mesh, then why not fix them, while using Ethernet? RPR tries to solve layer 3 problems, such as bandwidth allocation?

A: A group of companies are trying to address a certain set of customer concerns.

Q: It is not specified in the PAR whether RPR is targeted to enterprise or service providers?

A: Why need to specify?

Comment from 802.3 member: We are not to debate technical superiority here. RPR is distinct and it is a matter of market potential which will decide.

IEEE 802.3 AdHoc group volunteers (9 members) are to formulate formal questions until 5 pm Tuesday deadline.

5:00pm: Back from the joint meeting, and more followup discussions within RPRSG

- Jumbo packet problem already been solved elsewhere, etc

End of Monday.

Tuesday, November 7, 2000

8:30am: Agenda Scrub (Mike Takefman)

8:35am: Presentation: "iPT Header" (Allan Pepper)

- Identical to T1X1.5 GFP payload header (gone for the vote in ANSI)

Comment: customer FCS is stripped and iPT CRC is regenerate. A potential issue.

Q: When customer FCS gone bad, iPT drops it at ingres mandating store and forward capability at ingress? More discussions..we are not WG yet, and it is what it is now.

Q: Dest port, HEC recalculation, TTL limits 256 max node, etc

Q: IP type support? A: Yes. More discussions on delineation, especially using HEC

9:30am: Presentation: "RPR: What is the game? Why do we want to be part of it? What is the winning story?" (Frederic Thepot)

- Dynarc
- No control plane and QoS with Ethernet, potential issue for Ethernet MAN
- RPR is just another blade for IP support, on top of Ethernet, and a good clear concept
- RPR is not a chain of Ethernet switches. Do we have a consensus on this?

Comment: Is RPR a distributed switch, as opposed to a chain of Ethernet switches? Yes.

- What should be the model for RPR, distributed switch or ADM or what?
- This presentation is about just an ideal, not how to do it.
- Are we doing a ring or an add/drop mux?
- Behaves like a distributed switch, but not the distributed switch?
- Control plane is necessary for plug and play auto-topology, resource management advertising – enabling stateful layer 7 switching
- Resilience through multiple scenario, e.g., single ring plus bus, double bus -> possibility of mesh extension?
- Multiple rings using WDM

Comment from @home: It is typically cheaper to have multiple slow links.

- How about coordination between the multiple rings
  - Dynarc does this currently at L3.

11:00am: Some recap from Mike Takefman on 802.3 concerns

- iPT addresses customer separation need (originally forwarded by Roy Bynum)
- Exite@home does not see such need, since it only provides residential IP services
- need to be solved by RPR or should it be done by MPLS?

11:20am: 3 RPRSG members came back from 802.3 Ad Hoc meeting, and briefed on the progress

- Bob Love: Need to address the uniqueness question "802.1 and 802.3 can do the same stuff with extensions" Answer should be why that is not the case. Bob will get an explicit list of questions from 802.3.
- Khaled and Nader: VLAN field length, additional fields, customer separation
- Discussion on capacity reselling – can be done using MPLS. Should we make a list of features?
- We do not have exact implementation details yet. Take it as an input for better.
- Big discussion on ring vs. mesh again. Existing fibers are in ring, and we are going to optimize the existing rings.
- Answer to why another new MAC needed from a clean sheet
- new Rapid configuration STP?

11:55am – 1:15pm: Lunch break

1:30pm: Presentation: RPR vs Ethernet Switched Ring (Donghui Xie)

- Compares Switched Ethernet Ring w TCP vs. DPT w 10 nodes, covering 200km
- Simulation results shown
- Ethernet convergence is shown to be dictated by TCP performance
- Pointed out that simulation setup and parameter values needs more clarification

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2:05pm: Response to 802.3 ad-hoc group concerns on 5 Criteria

- 802.1D STP link cut in rings: a new STP 802.1s (in ballot)
    - 2 VLANs with different cut points, then mechanism required for choosing VLAN. Not a clean solution, and moreover, each VLAN traffic will also have to go a long way.
- Convergence time – new 802.1w (Rapid STP) simulation shows 10s of ms
    - also true regardless of network size wrt # of nodes and distance?

Break sets in without completing the task at this point…

3:00pm: Visit from 802.1 chair (Tony Jeffree): private discussions

3:30pm: Bob Love leads response discussion *(Final list is also available on the web)*

- Define the uniqueness problem (brainstorming)
    - Major customers, Sprint for example: Leverage existing installed plant; physical topology is a fiber ring, requires customers separation; large number of nodes on the ring (exceeding up to 30 for Sprint, expect more than 100 for some customers); ability to offer more dynamic services such as broadcast quality video while maintaining strict QoS; rapid (real-time) provisioning, reduce the need for new ADMs; Lossless transit path through the ring; less cost with performance – protection switching; Flow rate must be controlled from the ingress node onto the media; protection switching associated with each service to provide economic optimization including b/w and the costs associated with providing the highest levels of protection where they are needed; minimum jitter per-node.
    - Support for low cost solution with topology of a single ring?
    - Support for dual rings
    - Support for multiple rings (e.g., DWDM applications)
    - Low-latency
        - isochronous data-transfer
        - guaranteed QoS parameters
    - Multiple encapsulation fully embedded virtual network support
    - Provide customer separation
    - Scaleability
    - Passthrough traffic allows for scaleability at much lower costs…
    - Providing jitter control for synchronous services
    - Add drop MAC layer function
    - Per-hop switching poses scaleability problem for the switch backplane

- Connectionless shared ring allows for over-subscription of bandwidth (optional long packets)
- Large MTU support
- Support for SLAs?
- Path redundancy and quick restoration
- Segregation and discrimination of traffic
- MAC level service bandwidth management
- Fields that we may want to add that are not supported by present MAC
    - TTL
    - Ring node address
    - Hierarchical headers (customer separation TAG)
    - Accurate wall clock distribution
    - Larger tags for VLAN
    - Provider independent networks
    - Robust header protection (checking)

4:30pm: Brainstorming ends, and 50 copies of the sheet handed out for evening hotelwork assignment

Suggestion: Each person brings in 3 items of "what differentiates RPR?"

4:30pm: Presentation: RPR Market numbers (Lauren Schlicht)

- 8-10 billion dollars projected for the next 3-4 years on SONET-on-steroid

4:50pm: Adjourn, with hotelwork to do.

9:00pm: More discussions on response to 802.3 ad hoc concerns, until 1:00am?

9:30pm: Discussion of interest in a proposed RPR Alliance is being held in Rm 312 (Proposal presented on Thursday and posted on the web as "RPR Alliance Presentation – Bob Love)

End of Tuesday

Weds, November 8, 2000

9:00am: Joint discussion session with IEEE 802.1 (Chair: Tony Jeffree)

- Overview on PAR and 5 Criteria (Mike Takefman)
- Roy Bynum of Worldcom volunteers for operational experience in January
    - RPR provides 1/10 of cost of ownership when compared to FR
- No major questions have been raised from 802.1 members
- Some discussion on link cut problem of STP - use multiple VLANs to fix? Doable, but very likely be ugly, as in ATM LANE.

10:20am: More on 802.3 Response followup:

1:00pm: Editing of Memo response begins after lunch break *(Available on the Web)*

2:10pm: Capability Matrix editing (Bob Love)

- Priority list from the brainstormed items
- Some discussions whether to take a strong position in some of the feature comparisons, e.g., bounded delay/jitter on ring, low latency, etc. - Yes.

3:00 – 3:15pm: Break

3:15pm: Resume on Capability Matrix (Bob Love)

- Finalize the key feature comparison matrix
- Edited 5 Criteria, item 5. Economic Feasibility in response to 802.3 concerns

Voting for the new 5 Criteria item 5 Economic Feasibility

Motion:
To approve Criteria #5 on Nov 8, 2000 as per changes requested by 802.3 ad-hoc
(M) Nader Vijeh
(S) Robin Olsson
(Y) 28 (N) 0 (A) 1

Motion:
To reaffirm Criteria #1 on Nov 8, 2000 as per submission to the SEC in October.
(M) Danny Gentry
(S) Bob Love
(Y) 27 (N) 0 (A) 0

Motion:
To reaffirm Criteria #2 on Nov 8, 2000 as per submission to the SEC in October.
(M) Martin Green
(S) Necdet Uzun
(Y) 28 (N) 0 (A) 0

Motion:
To reaffirm Criteria #3 on Nov 8, 2000 as per submission to the SEC in October.
(M) Dave Meyer
(S) Vince Eberhard
(Y) 30 (N) 0 (A) 0

Motion:
To reaffirm Criteria #4 on Nov 8, 2000 as per submission to the SEC in October.
(M) Harry Peng
(S) Lars Ramfelt
(Y) 30 (N) 0 (A) 1

Motion:

To elect Michael Takefman as Incoming Chair for RPRWG.
(M) Bob Love
(S) Khaled Amer
(Y) 30 (N) 0 (A) 1

Motion:
To reaffirm the PAR on Nov 8, 2000 as submitted to the SEC in October.
(M) Albert Herrera
(S) Khaled Amer
(Y) 31 (N) 0 (A) 0

Motion:
To approve the response to the memo from 802.3 (ad-hoc group) on Nov 8, 2000.
(M) Albert Herrera
(S) Khaled Amer
(Y) 27 (N) 0 (A) 0

4:20pm: Discussion on where to have the next first WG Meeting
- 802.3ae meeting held in Irvine, CA.
- Jan 15, RPR alliance cohost meeting
- Jan 16, 17 (Tuesday, Weds) in SJ area
    - WG voting right will be acquired by attending the first March Plenary
- Action item (Mike Takefman)
    - To post specific agenda for the first WG meeting in the reflector, e.g., what to achieve, objectives, etc

5:00pm: End of Weds.

Thursday, November 9, 2000

8:30am: Proposed 802.17 RPR Working Group Charter (Bob Love) – posted on the web as "Current RPRWG Charter – Bob Love"

Bob Love lead a discussion on a proposed working group Charter. This charter will be reconfirmed at the first plenary of the working group. Much discussion on many points, culminating on a motion to approve the charter.

The RPRWG is to:
- Define and develop standards for a resilient packet ring (RPR) access protocol for use in local, metropolitan, and wide area networks for transfer of data packets at rates scalable to multiple gigabits per second.
- Specifically address the data transmission and networking requirements over present and planned fiber optic physical infrastructure in a ring topology.

- Define and develop detailed specifications for using existing and/or new physical layers at appropriate data rates what will support transmission of this access protocol
- Develop extensions and improvements for this protocol as needed.
- Provide ongoing support for the set of standards developed, including:
    - Cooperatively working with other IEEE 802 groups and other standards bodies addressing physical layer and internetworking issues.
    - Issuing errata and corrections to the set of standards developed.

Motion:
Accept as Charter for the Resilient Packet Ring WG
(M) Necdet Uzun
(S) Khaled Amer

(Y) 19 (N) 0 (A) 0

9:15am: Some more discussion on the response "key feature matrix"

9:30am: Joint meeting with 802.3 group (Questions and comments are from 802.3)

- Bob Love gave a report on 802.3 ad hoc memo raising a concern wrt uniqueness.
- Mike Takefman continues on with key feature matrix.

Q: Define Ethernet bridge?
A: 802.1D, with multiple MACs
Q: With a thin layer on top of 802.3 (between 802.1 and 802.3), what of the feature matrix cannot be achieved?
Comment: Dynamic add drop in a shared medium for service providers which is currently not provided. (Roy Bynum)
Comment: Multiple VLANs to emulate ring, but ugly, so need RPR (Norm Finn)
Comment: Totally unconvinced that there should be 802.17 group. Simply cannot understand. (Jonathan Thatcher)
Comment: In favour of RPR - not a good ring if Ethernet is forced to do so (?)
Comment: In favour of RPR - no standard group exist for Metro ring fiber installation (Yong Kim)
Comment: In favour - there is customer need (Bruce Tolley)
Comment: Current metro service carrier need is significantly different from Ethernet design intent, e.g., large packet size, clean sheet packet format, thus need standard effort. But shared medium ring is immature just as CSMA/CD was. Grow out of it. (Geoff Thomson)
Comment: Ethernet designed for private LAN, RPR targeted for service carrier MAN (?)
Comment: Still not convinced that RPR is a new MAC. Agree with the concept but should be under 802.3? (Jonathan Thatcher)
Answer: RPR is not Ethernet. May want to use Ethernet PHY, but it is not Ethernet.

(Mike Takefman)

Directed motion: No
Technical motion: The chair of 802.3 is to support the RPR PAR and 5 Criteria.
Votes: (Y) 71 (N) 18 (A) ?

10:25am: Wrapup session (Mike Takefman)

- Hotel for the January Interim meeting
  - SJ area on Jan 16-17, to be announced in the reflector
- Will need an overview presentation (company-neutral) in January for the newcomers. MikeT will make one and post in the reflector.

10:45am: RPR Alliance Update (Bob Love) – posted on the web as "RPR Alliance Presentation – Bob Love"
11:00am: End of November meeting.

List of Action Items

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1. Mike Takefman's task force on D/Q/p compatibility (Not resolved)
2. Suggestion on Web-based action item tracking. Will be considered
3. RPRSG should discuss how to deal with IETF liaison issue
4. Roy Bynum of Worldcom volunteers for operational experience in January
5. To post specific agenda for the first WG meeting in the reflector, e.g., what to achieve, objectives, etc. (Mike Takefman)
6. An overview presentation (company-neutral) in January for the newcomers (Mike Takefman will make one and post in the reflector)

Signed Attendance List:

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58 individual, 39 organizations

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End of November Plenary Meeting Minutes.