IEEE 802 RPRSG (Resilient Packet Ring Study Group)
Interim Meeting Minutes
Santa Clara, CA, Aug 28-29, 2000
Reporter: BJ Lee

8/29/2000
40 individual attendees representing 23 organizations
(Attendance list is attached at the end, along with the
action items, and unresolved action items from the
previous July Plenary meeting)

9:00 Welcome and Introduction (Mike Takefman)
      Reminded the IEEE Plenary in November
      Next Interim in Jan? Ottawa, Denver, or piggyback onto 802.1 802.3?
      Agenda Scrub
      Minutes of July Plenary meeting is scheduled to be approved
        on August 30, 2000 (Not Closed)

9:30 Update on IETF IPoPTR BoF (Abert Herrera)
      Khaled Amer volunteered to help write the framework and architecture draft

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Presentation - Winning through standards development (Bob Love, 802.5 Token Ring
WG chair)
 Speaks for Lantern Communications, but emphasized win/win for everybody

 - presented his view on successful standardization process
  * sample objectives and scope
  * First Steps
   - PAR: broad enough to include solution set and narrow enough to focus the
group
   - responses to the 5 criteria should satisfy skeptics and opponents of the
PAR
   - should be prepared to address concerns raised by other working groups
   - expect to get good ideas and criticisms, and ready to tweak
  * What's important
   - look for ways to build consensus, the standard will follow
   - organization ...to decrease the work and speeds the process
   - attention to details...little gotchas can slow the standard
  * Working group Operation
   - operating rules, processes, and procedures - everybody should be familiar
with
  * examples of procedures - presentation format with no company logos or page
    layouts that unduly add to the size of the resultant PDF files
  * organization of web pages for efficient access of information
  * Organization of the Work: overall schedule, issues and progress tracking,
      all important documents on web, move multiple issues to resolution in
parallel
  * IEEE 802 Standards Principles
   - process, consensus, openness (individuals and world-wide), balance
     (balloting between developers and users), right to appeal (both procedural
     and technical anytime during the process)
  * Comments on Schedule

- can only meet schedules only by adhering to the 3 "C"s - commitment, cooperation, consensus
* Bob Love's front End suggestion:
- August : establish objectives, scope, and time line, PAR, 5Cs
- Oct: email PAR and 5Cs to SEC reflector and on web
- Nov: complete PAR and 5Cs, separates votes on PAR and each of the 5Cs, review with all WGs, SEC approval to form a working group
- Dec: IEEE Stds Board approves new 802.17 RPR working group

Comments (Howard Frazier): make sure that PAR makes into December Board meeting agenda by Oct.
First meetings of WG will be in Jan Interim, March Plenary
Question on membership: LMSC rule is de facto, but can be overuled by WG rules
WG Chair selection will also be decided by SG request submission along with PAR (Howard Frazier)

10:18-10:30 Break

10:33am 802 Compatibility (Mike Takefman)
802.1D,Q: no compatibility issue found by 4 volunteers (Nader Vijeh, Denton Gentry, Dave Meyer, Jason Fan)
Discussions:
(Dave Meyer) on "frame mis-ordering" - MAC service does not permit Frame Mis-ordering in 802.1D
(Nader Vijeh) In 802.3 link aggregation case, the misordering is a possibility, so 802.3 decided on "minimizing"
(Denny Gentry) recapped his findings: e.g., DQDB has similar problem with transparent bridging due to lack of broadcast
(Howard Frazier) suggests a task force from now to Nov to nail down this issue ...and starts communicating with 802.1
to avoid surprises---it will be organized by Mike Takefman
(Devendra Tripathi) any issue with Rapid Reconfig in 802.1D? ...not likely...

10: 55am
Presentation - Objectives of RPR (Nader Vijeh)
- MAC to address deterministic service, high availability and cost optimization in packet based,
high speed optical fiber rings for LAN/MAN and WAN applications
- Address carrier and service provider requirements
- Support multimedia distribution as well as real time voice and video over packet applications
- Differentiate from Ethernet: high availability, priority/multimedia multicast/broadcast nature vs mesh Ethernet

Question: multimedia implies LLC services for connection setup and b/w reservation (Devendra Tripathi)
Comments: examine existing services and identify the layers and costs which RPR can eliminates (?)
Question: How about existing TDM traffic...is it the objective of RPR? (?) - Nader's answer: not likely
Question: Objectives should include addressing the challenges faced in WAN public networks? (?)
- Answer: should be aware of those challenges when devising solutions, e.g, peer level SLA's

Comments: provide media-independent MAC as an evolution from hugh installed base of circuit ring to
packet ring for carriers (?)

Presentation continued - Scope of RPR (Nader Vijeh):
- Distances and Nodes
MAN up to a min of 100Km circumference and 128 nodes
WAN up to a min of 1000 Kim and 256 nodes
- Speeds: up to a min of 10Gps
- Physical layers: full duplex Gig Ethernet as well as 10G Ethernet physical layer
- utilize SONET physical layers (OC-3/12/48/192?)

Question: lower bound on the link speed? OC3? 3 People think OC3 needed..
Comments: make MAC independent, and formulate parameter table for distance (Thomas Mathey)
Comments: max number of nodes...128 is even considered large (Mike Takefman)
Comments: fixing the limit on the number of nodes not necessary? (?)
Comments: leave it open for other physical layer formats (Raj Sharma)
Question: are we developing new physical spec? time-line concern with MAC (Bob Love)
Comments: PAR is the first project of the new working group, it is ok to include new
phy layer spec within the charter which will be presented to SEC for approval (Howard Frazier)
Comments: DWDM handling interface might be necessary...no standard yet, but proposals exist.(?)
Comments: services may depend on frame delineation, such as jitter - thus the new interface format may be necessary(?)
Comments: focus on L2 and ready to be open to new phy standards for dark fibers, and so on (Devendra K. Tripathi)

- Scope of RPR - continued
- dual counter rotating ring architecture
Comments: dual interface made independent for cost reduction?? (?) e.g., dual counter-rotating
is one configuration, single ring should also work for volume marketing-FDDI lesson-
they will buy RPR for cost reduction purpose, single ring configuration solution necessary (?)
- sub 50ms restoration
Comments: 50 ms mostly applies to link failure, for HA (High Availability) requirements for
nodes could be 1-2ms..dependent on vendor implementation (e.g., hot standby, N:1
protection)..thus should not be part of the standard (Raj Sharma)
- 802.1D/Q/f compatibility
- support packet sizes based on adopted phy layers
Comments: max packet size should be limited by control packet delay consideration (Dave Meyer)
- Define fair and dynamic b/w distribution and congestion control mechanisms
- ease of configuration management

12:00-1:10pm LUNCH

1:15pm
Presentation - RPR MAC Model (Raj Sharma)

- not a proposal .. the purpose is to highlight issues and possible solution approaches
A model with service primitives including Clock.request and Clock.indicate is presented
Luminous's reference implementation:
Question: why RPR TM sub-layer separate from RPR MAC control entity? (?)
Question: duplication of QoS functions in IP and L2 RPR TM sub-layer (Heng Liao)
Question: shim layer between LLC and MAC (Raj Sharma)
Question: "MAC control" term has distinct definition in other groups (e.g., 802.3), so should be changed .. rather RPR control? Semantic issue... (?)
Question: scalability issue with TM sub-layer...traditional buffer insertion does the access arbitration, but here MAC does not do the arbitration,
arbitration is done at the TM layer?
Question: different from traditional MAC concept? (?)
Comments: the model lacks the physical layer transparency (Heng Liao)

2:00pm PAR (Mike Takefman and others)

- No problem with numbering 802.17
- Title issue: Resilient Packet Ring Access Method & Physical Layer Specification
Comments: appropriate to include the term "Physical Layer Specification" (?)
Comments: how encompassing is "Ring Access Method," e.g., has TM sub-layer over MAC, etc
- name of the working group : Resilient Packet Ring Working Group
- Selecting the working group chair: need to put forward the name at the time of PAR submission in Nov (Howard Frazier)
Question: is it mandatory? Answer: it can be changed
- If there is any volunteer for the chairmanship, they let it known by November
- More discussions on the wording in 9. Scope of Proposed Work: RPR "Media" Access Method ... omission of "media" or with?
Question: if the network is built in a linear fashion, it can be claimed as "compliant"? (?)
Answer: we standardize the box implementation, the linear topology could be considered as another application of RPR...
Answer: another such example would be the degenerate case of 2 node ring
Comments: in 802, the media access and access is synonymous !! (Howard Frazier)
Comments: for consistency, it is suggested that we take out the term "media"...done
Question: what is placed in-between RPR rings? (?)
Answer: it is beyond the scope of this group - rather it belongs to 802.1D or IETF (?)

- More discussions on the term "WAN" in 9. Scope of Proposed Work
Comments: the term "Wan PHY" is also used in 802.3 (Mike Takefman)
Comments: it was meant to be "SONET PHY" (Nader Vijeh) ... WAN implies compatibility with SONET??
Comments: IEEE 802 needs to expand into WAN, and it is a good thing, why the excitement for this word? (Howard Frazier)
Howard also pulls out 802.3ae PAR where WAN wording has been used.
Comments: use "networks in local, metropolitan and wide areas" (Bob Love)
* original paragraph remains intact

- Discussions on 10. Purpose of Proposed Project
 Question: where is "packet" in the paragraph? (?)
 Answer: replace "optimized for data transmission" with "optimized for packet transmission"
 Answer: the term "optical" removed from "resilient optical ring topology"
Check the final version of PAR for more complete revisions

- Discussions on 12. other standards?
ANSI T1X1.5 are working on related issues improving SONET carriage of data packets.
Their current scope does not include a bandwidth allocation scheme.
 Comments: This group may be able to borrow this standard for packet over SONET carriage mechanism. (Mike Takefman) We are keeping on eye on it.

- Discussions on 15. Proposed Coordination/Recommended Method of Coordination
 Comments: no formal relationship between IETF and IEEE (Mike Takefman)
 Comments: ANSI X1T1.5? (?)

- Discussions on 16. Additional Explanation Notes

Motion: To approve the PAR as edited and to forward it to the SEC for consideration at the November 802 Plenary
and request that the chair of 802 forward the PAR to the NESCOM secretary for inclusion on the agenda of their
December meeting.

(M) Howard Frazier
(S) Luaren Schlicht
(Y) 38 (N) 0 (A) 0
(number of companys:23)

3:40pm
5 Criteria bashing:

Item 1. Broad Market Potential
 Question: market potential in numbers? (Bob Love)
 Action Item: Lauren Schlicht will post numbers in the reflector
After some more editing...

Motion: To approve Criteria 1 as edited and to forward it to the SEC for consideration at the November 802 Plenary.
(M) Aaron Dudek
(S) Bob Love
(Y) 38 (N) 0 (A) 0

4:10pm
Presentation - T1X1.5 Activity Update (Lauren Schlicit)

- T1X1.5 proposes that it will borrow the access control mechanism of IEEE RPRWG
- What has been done in T1X1.5:
      GFP (Generic Framing Procedure)
      Started discussion on protection switching
      Next step: break-out meeting to discuss a potential MAC definition

- Make your concerns known: topology discovery, protection switching, and other control mechanisms
- Try to attend the next meeting
      Oct 9-13, Fairfax VA (Data over Sonet Oct 10-11)
      No membership required, just show up

4:20pm
Presentation - Draft Response to T1X1.5 (Albert Herrera)
  Comments: post the URLs for the pertinent documents

802 RPRSG Position:
802 RPRSG is aware of work underway within T1X1.5. Although there is potential for significant overlap in MAC
definitions and functionality, it is understood that requirements at T1X1.5 might actually go beyond simple Data
over SONET as the Standards Project name seem to imply. Given that 802 RPRSG is striving towards a similar but
media independent MAC protocol, it would be beneficial to all parties involved if efforts were focused toward a
common standard specially in areas yet to be developed within T1X1.5 (I.E., topology discovery, protection
switching, Congestion control, etc.).

Action Item: The draft will be sent out to the RPRSG reflector on the evening of Aug 28, 2000 for review overnight.
Comments: The draft letter does not explicitly mention what we should do for effective collaboration? (?)

4:30pm
-Back to discussions on 5 Criteria Item 2. Compatibility

Question: VLAN tagging between (e.g.,) Ethernet LANs through RPR may be an issue? (Tom Black)
 Comments: 802.1 added on to 802.3ac, what implication for RPR? (Nader Vijeh)
 Comments: Mapping is the provisioning/policy problem...not the RPR issue (Raj, Sanjay)
   Comments: then, things can get complicated for VLAN service providers (??)
 Comments: RPR can just encapsulate VLAN tagged frames?? Vs. translational bridging...and more debate and discussions
      ....deferred to reflector discussions and the task force?...

Motion: To approve Criteria 2 as edited and to forward it to the SEC for consideration at the November 802 Plenary

(M) Bob Love
(S) Khaled Amer
(Y) 33 (N) 0 (A) 0

- Discussions on Item 3. Distinct Identity
 Comments: major red flag anticipated in this area....we need to emphasize why ring...e.g., bandwidth sharing in a fair manner, etc...(?)
 Comments: Is this a place to emphasize large MTU? Performance and implementation complexity due to large MTU need to be further investigated
      ...ring speed dependent MTU size for QoS, e.g., configurable? Configurable MTU defeats plug-and-play spirit? Auto-negotiation?

Packet discovery mechanism in IP will make this issue moot?
Comments: Sprint pointed out that the large MTU is necessary to support multiple encapsulation (typical in the Internet) for tunneling
..which is common through IP network...4476 bytes (Aaron Dudek)

Motion: To approve Criteria 3 as edited and to forward it to the SEC for consideration at the November 802 Plenary.
(M) Khaled Amer
(S) Bob Love
(Y) 31 (N) 2 (A) 0

August 29, 2000 (Second Day)

9:00 Welcome and Agenda Scrub (Mike Takefman)
Comments: it was suggested to include a session to discuss the scope of objectives (a sort of superset of current PAR)
for the working group. (Bob Love) Suggestion accepted.

- Discussion continued on 5 Criteria, Item 4. Technical Feasibility
-some more changes

Motion:
To approve Criteria 4 as edited and to forward it to the SEC for consideration at the November 802 Plenary.
(M) Nader Vijeh
(S) Martin Green
(Y) 29 (N) 0 (A) 0

- Moving on to the final criteria 5. Economic Feasibility:

Motion:
To approve Criteria 5 as edited and to forward it to the SEC for consideration at the November 802 Plenary.
(M) Aaron Dudek
(S) Albert Herrera
(Y) 32 (N) 0 (A) 0

10:15am
- Discussions on the objectives of this PAR
Comments: minimum packet size will have performance implication, such as fowarding engine optimization (Heng Liao)

* Objectives (living list)
Support packets with:
Length >= Minimum
Length > 802.3 maxFrameSize (TBD)
How to deal with systems with different MTUs
Spatial reuse for unicast packets, efficient support for multi/broadcast packets and a method to insure packets
do not circulate forever (Voted on, and approved)
Media Independence - refer to (definition of "media"?)
SONET/SDH OC-768c/STM-128c
SONET/SDH OC-192c/STM-64c
SONET/SDH OC-48c/STM-16c

SONET/SDH OC-12c/STM-4c
SONET/SDH OC-3c/STM-1c
1 Gigabit Ethernet
10 Gigabit Ethernet LAN PHY
10 Gigabit Ethernet WAN PHY
Scalability
Nodes [2..128/256]
Span Distance
Ring Circumference
*Dual counter rotating rings with no packet loss
Distributed congestion management
*Fair and dynamic distribution of available BW
Ring selection
- layer 2 with hooks to allow layer 3
Plug and play, and fast recovery and restoration
Notification to layer 3
Class of service support
provide support for guaranteed and committed data rates and delays
priority on the ring
Instrumentation and performance monitoring
Comments: in-band performance monitoring, e.g, delay measurement, and so on?
*Conformance and interoperability testing
*Loss-less low delay transit path
no frame reordering within the same service call
no frame duplication under normal operation...
minimize both during fault conditions
Encapsulation and packet types
Ring header extensions
Extensions to 802.1Q
Ethernet v2 vs 802.3 LLC/SNAP

The above objectives have been listed, discussed, and some of the items have been voted upon for agreement to put
a stake on the ground....the wordings will be refined later

Comments: might need unprotected services? (?)
Comments: on fault recovery (Raj Sharma) - the term "minimize packet loss..." is duplicated with "< 50ms restoration"
...the comment was voted on and approved

1:15pm
Presentation - Metro Packet Ring Simulation Results (Adisak Mekkittikul)

- Details of flow control mechanism not revealed....
Comments: noted that the disturbances by non-conforming nodes in the time scale of 2-5ms? (BJ Lee)
Comments: was pointed out that TCP traffic comprises more than 90% of internet traffic (Sanjay Agrawal)
Question: convergence behaviour due to number of nodes contributing? (BJ Lee)
Answer: no, rather depends on ring size
- also showed switch-over performance....600uS service interruption

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2:00pm
Presentation - Performance modeling: Initial Simulations (Khaled Amer)

Comments: debates on single ring vs dual ring simulation: one particular mechanism does not utilize control packets (Raj Sharma and others)
Comments: hubbing scenario does also have downlink traffic distributed around, so the mesh pattern with random destination would be
a better scenario for the initial study (BJ Lee)
Comments: how to ensure the TCP models have identical behaviour (Heng Liao, BJ Lee)
Comments: packet size distribution: 9K? Trimodal (40% 64B, 40% 512B, 20% 1512B) one case, others?

Final list for the initial comparison study is deferred to the reflector discussion.

4:20pm
Presentation - Draft proposal of working group charter and scope (Bob Love)

----- to be updated ---------------

List of Action Items:
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1. Mike Takefman to organize a task force (from now to November) to nail down the IEEE802.1D,Q
compatibility issue. The task force is also expected to start communicating with
802.1 WG (Tony Jeffree) to avoid any surprises. Investigate 802.1w Rapid Reconfiguration Scheme?
2. Lauren Schlicht will post the size of market potential in numbers to the RPR reflector
3. Albert Herrera will send out the draft response to T1X1.5 to the reflector on Aug 28
for the review and approval (Closed)
4. Khaled Amer to post the Performance Modeling List on the reflector and finalize the list.

Unresolved Previous Action Items (July Plenary meeting)
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1. Approval of July Plenary meeting (La Jolla) minutes
2. ACTION #1 - Investigate and report on 802.1 bridging issues
Due 3wks - Harry Peng, Denny Gentry, Raj Sharma, Vince Eberhard
3. ACTION: Write up layering of MAC (Nader/Tom) diagram) and
assumptions on building a bridged network. This will be emailed to the RPRSG
reflector and discussed the referred to the 802.1 reflector for comments.
The goal will be to get their agreement on our positions.
Heng and Tom to draft, everyone will review. Draft ready in 2 weeks.
4. ACTION: Draft a "Press Release" for IEEE and Others(trade) publications
- Mike to send draft to the reflector within 4 weeks editing/decision during next interim

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Attendance: (40 individuals, 23 organizations)

Mike Takefman tak@cisco.com
Albert Herrera albherre@cisco.com
BJ Lee bjlee@cisco.com
Martin Green marting@cisco.com
Tom Black tomblack@cisco.com
Mike Davis mfdavis@cisco.com
Howard Frazier hfrazier@cisco.com
Robert Love RDLove@ieee.org
Vince Eberhard Vince.Eberhard@conexant.com
Dave Meyer Dave.Meyer@conexant.com
Lauren Schlicht lauren.Schlicht@conexant.com
Harsh Kapoor hkapoor@appiancom.com
Khaled Amer khaledamer@usa.net
Tom Mathey tmathey@concentric.net
Markus Hidell mahidell@dynarc.se
Lars RamFelt larsh@dynarc.com
Frederic Thepot frederic_thepot@dynarc.com
Patrick Cullen pad@dynarc.com
Denton Gentry denny.gentry@eng.sun.com
Nader Vijeh nader@lanterncom.com
Adisak Mekkittikul adisak@lanterncom.com
Johan Von Besovw Jvonbesovw@Timetra.com
Sunil Khanderkar sunil@timetra.com
Hon Wah Chin hwc@oni.com
Luc Roy lroy@alidian.com
Sanjay K. Agrawal sanjay@luminousnetworks.com
Jason Fan jason@luminousnetworks.com
Raj Sharma raj@luminousnetworks.com
Allan Pepper acpepper@nortelnetworks.com
Sharon Martin sharonm@orckit.com
Necdet Uzon nuzun@auroranetics.com
Gunes Aybay gunes@riverstonenet.com
Darrell Furlong dfurlong@Lancast.com
Aaron Dudek adudek@sprint.com
Perminder Chohan chohan@amcc.com
Yongbum Kim ybkim@allayer.com
William Dai wdai@allayer.com
Heng Liao Liaoheng@pmc-sierra.com
Devendra Tripathi tripathi@vitesse.com
Robin Olsson robino@vitesse.com